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STEEL

The Magazine of Metalworking and Metalproducing

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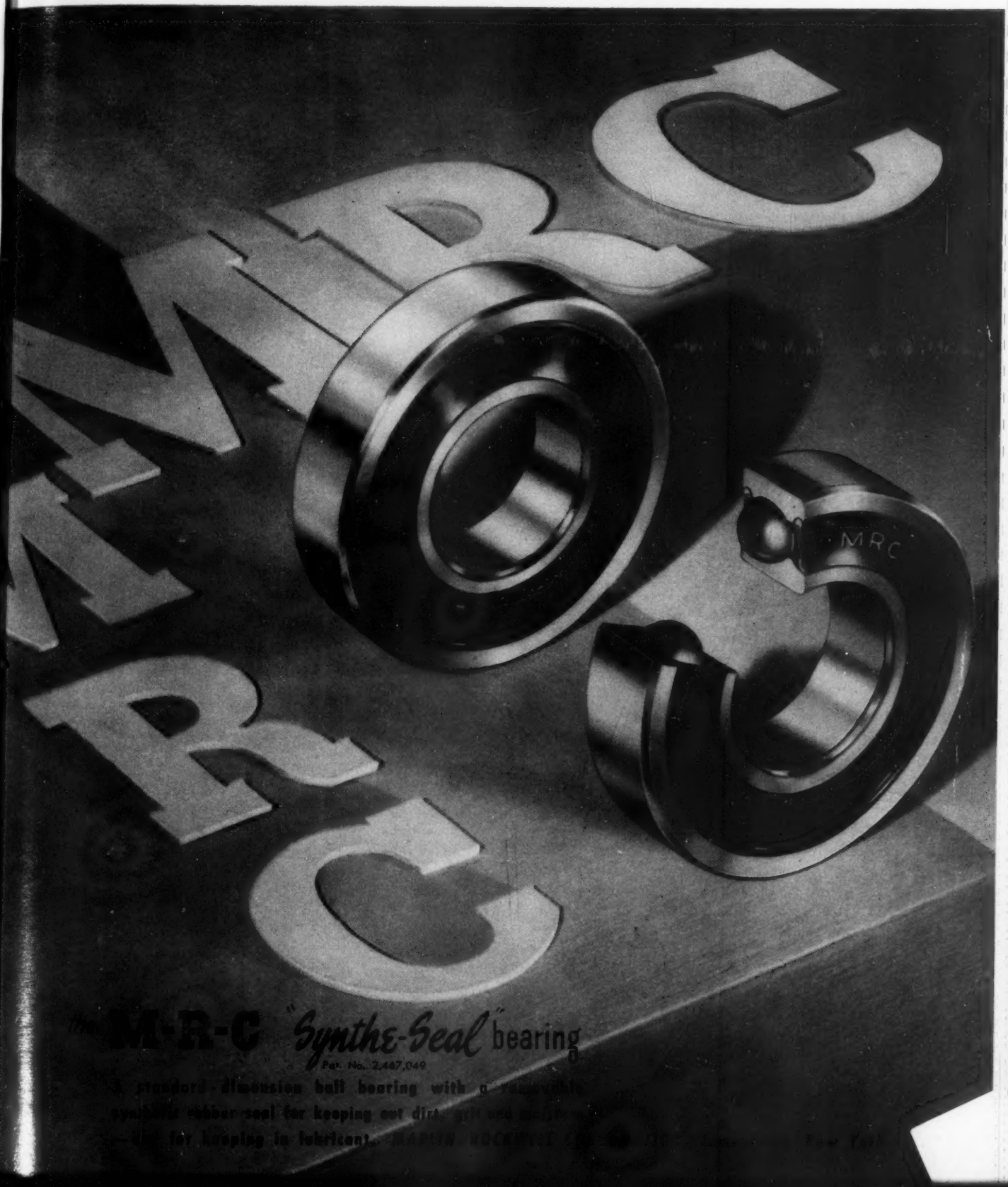
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September 26, 1949

Why Not Bargain?

Anyone who has read the complete text of the report of President Truman's fact finding board must have been impressed by the discussion pertaining to collective bargaining on pages 21 to 26. Here board members declare that one of their problems is "what, if anything, should the board recommend about the practice . . . which has grown up in this industry and which seems to have stifled the process of collective bargaining?"

In discussing this problem the board goes into detail as to how industry-wide bargaining has largely replaced collective bargaining. It also upholds the steel companies' claim that prior to the intervention of the President in the current dispute, there had been little collective bargaining between individual companies and unions. It strongly recommends that labor relations be put back on a basis of collective bargaining or "if a different concept of collective bargaining from that heretofore held is needed, then a . . . . reappraisal should be made by the appropriate body, which we think is Congress itself."

Clearly then, the board feels that the present dispute should be settled by collective bargaining. However, there has been no collective bargaining since the report was issued. The steel companies have stated their willingness to bargain on the basis of the report. Mr. Murray has likewise stated his willingness to bargain, but refuses to sit down at the bargaining table until the steel companies have committed themselves beforehand to acceptance of the recommendations of the report.

This can only mean that Mr. Murray really is unwilling to bargain, for if the companies accepted his terms there would be nothing over which to bargain. In view of the board's report and in view of President Truman's statement at a press conference that he understood that the companies and union were to bargain "on the basis of the report," it is difficult to see how Mr. Murray can maintain his present position without assuming full responsibility for provoking a strike if it occurs.

The President has asked and received assurances from both sides that the deadline be extended to Oct. 1. Should Mr. Murray yield to collective bargaining before that date, his union most certainly could expect a better break than it could win by striking.

* * *

SLAMS DOOR ON ABILITY: Action of the United States Senate in refusing to confirm the appointment of Carl A. Ilgenfritz as chairman of the Munitions Board may prove to be a blunder of major significance.

Mr. Ilgenfritz's salary as head of the Munitions Board would have been a mere fraction of the salary he receives as vice president in charge of purchases for United States Steel Corp. He was willing to waive the government salary if he were permitted to continue to receive his private salary. In turning down his appointment on "principle," the Senate probably was influenced by Sen. Harry F. Byrd's statement that "we haven't got down to the point where we must have government positions subsidized by outside interests."

Senator Byrd is so right on many issues that one regrets to say he is wrong in this case. He must have forgotten the priceless service rendered by "dollar-a-year" men in every recent national emergency. The government cannot keep experts of this caliber on its payroll on a full time basis, but under the dollar-a-year plan

(OVER)

can "borrow" for brief periods the nation's most competent individuals to perform special, difficult spot jobs.

This is not service "subsidized by outside interests" as Senator Byrd contends. It is service performed proudly by citizens specially qualified for the job at hand—citizens who should not be penalized financially because they volunteer for public tasks. —p. 42

* * *

EFFECT OF DEVALUATION: Initial reaction to the devaluation of pound sterling and other currencies is somewhat mixed. One notes that in Washington many government spokesmen are much more inclined to minimize the effects upon the American economy than are representatives of industry throughout the nation.

Almost everybody agrees that machine tool, machinery, automobile, farm implement, steel and some other exports from the United States will encounter stiffer competition in foreign markets and will suffer some curtailment. There is less agreement as to how much imports from countries with devalued currencies will cut into the domestic market. The impact will differ widely, depending upon the type of materials and products involved.

Many authorities believe that there may be considerable confusion or even chaotic conditions during the initial period of adjustment, which may last for a number of months. Later competition for the long pull will begin to establish a new pattern of world trade.

—pp. 35, 36, 111

* * *

WAGE ADVANCE HIGHEST: Availability of this publication's new weighted steel price composite, in which the average for the base period, 1935-1939, equals 100, makes it easy to compare the rise in steel prices with increases in wages and prices of other commodities.

Whereas August base steel prices were up 52.5 per cent above those of the prewar base period, steel wage rates during the same period advanced 123 per cent, the index of consumers' prices (cost of living) was up 68.5 per cent, food prices were up 104 per cent, index of all commodities increased 88 per cent, prices of house furnishings advanced 87 per cent and apparel costs were 90 per cent higher.

In the light of these comparisons it is obvious why President Truman's fact finding board was so emphatic in discrediting Robert Nathan's weird economic presentation and in declaring no wage increase is warranted. —p. 39

* * *

TIME PAYMENT PLANS: Most plant equipment is sold on a net cash or 30 to 60 day basis or, if the work of installation is extensive, on a construction contract which calls for payments as the work progresses. Recently two companies have introduced deferred payment plans.

Buyers of presses from E. W. Bliss Co., Toledo, O., now can elect to pay 25 per cent down and the remainder in installments over periods from one to three years. Interest of 6 per cent is charged on the unpaid balance. Customers of American Wheelabrator & Equipment Corp., Mishawaka, Ind., can purchase its blast cleaning equipment, dust collectors and sand cutters by paying 25 per cent down and the remainder in installments extending from 6 to 30 months. Interest ranges from 4 per cent for 6 months to 6 per cent for 30 months.

Equipment manufacturers will be interested in seeing to what extent customers avail themselves of these opportunities to retain cash or credit for other uses. —p. 41

* * *

JOINING UNLIKE METALS: Modern design and manufacturing seem to be introducing an increasing number of situations in which it is desirable to join dissimilar metals. The demonstrated ability of resistance welding to perform this job is one of the chief reasons why this process has gained its present acceptance.

When similar metals are spot welded the highest resistance is between the interfaces of the two sheets, but when two dissimilar metals are welded the maximum resistance may not be between the interfaces of the two sheets but may be within the sheet of the metal which has the higher specific resistance. This and many other conditions call for unusual care in determining the proper settings for current, pressure and time in resistance welding dissimilar metals. Heat balance also is important. Sometimes the welding problem is complicated enough to warrant minor compromises in design of part and in chemical analysis of materials to insure a more practically weldable assembly. —p. 72

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

U. S. EXPORTS— Exporters of metalworking products can expect a chaotic market until the world irons out its currency wrinkles—which may take until early in 1950 (p. 35). ECA may help cushion the immediate shock, but producers of machinery, machine tools, finished steel, railroad equipment, farm machinery and automobiles can expect rough going in exports for the next few months. Long-term prospects are less gloomy as the result of the pound devaluation. The official Washington viewpoint is that cheaper sterling and other currencies will help relieve the world dollar shortage and consequently will shorten the ERP period and in the long run aid American exporters whose business now is poor anyway largely because of the scarcity abroad of U. S. money.

DEVALUATION BANDWAGON—Every nation in the world is refiguring its relative marketing position now that the pound has been devalued (p. 45). Result of new calculations is that more than a score of countries have followed Britain on the bandwagon of cheaper money, and perhaps ten more will take similar action. Major problem in the United Kingdom and elsewhere is that rising domestic prices and renewed demands from labor for higher wages may cancel out the gains from devaluation.

NEW DEADLINE—A week's reprieve has been granted in the steel wage dispute (p. 37). Steel producers and union negotiators have until Oct. 1 to iron out the problem of who is going to pay for insurance and pensions, the chief obstacle to agreement.

STEEL COSTS—Your base costs for steel have risen less in the past ten years than have the prices of most other commodities (p. 39). STEEL's new weighted steel price composite shows that August base prices were 52.5 per cent higher than they were in the base period of 1935-1939. Hourly wages of steelworkers are up 123 per cent over the base period. The cost of living is 68.5 per cent over the base years.

STEEL RATE—Now that the demand for automobiles shows faint signs of slackening, steel producers are wondering what might happen to their ingot rates if the No. 1 consumer of steel no longer has such record requirements (p. 46). An auto production at the 1939 monthly average of 311,059 would have required only 802,432 tons of ingots and would have helped put the August, 1949, ingot production rate at 70.5 per cent of capacity, arbitrarily assuming that all other consuming factors were equal. The actual rate last month was 82.2 per cent.

MACHINERY—Machinery producers like E. W. Bliss Co. and American Wheelabrator & Equipment Corp. seek to boost sales by selling on installment plans (p. 41). Initial payments of only 25 per cent down are required and buyers may pay the balance over a period of 30 or 36 months.

NO NEW TAXES—Chances are good that you need not worry about new federal taxes next year (p. 42). Early forecasts by Congressional leaders that new taxes were inevitable were based on these two estimates now proved inaccurate: That national income would fall, that government expenditures would bring a deficit of $3 billion. National income has soared to the high rate of $213 billion and the Senate has pared the government's requests for money by $1.5 billion.

HERE AND THERE IN INDUSTRY—Industry's policy of lending "dollar a year" men for government positions may end as result of the Senate's refusal to accept Carl A. Ilgenfritz on this basis as chairman of the Munitions Board (p. 42) . . . Americans will buy 24 per cent more lighting fixtures in the next 12 months than they bought in an average postwar year (p. 47) . . . American Radiator & Standard Sanitary Corp.'s Pittsburgh plant, closed since Apr. 29, is reopening (p. 38) . . . Department of Defense is broadening its program for aiding business to get armed forces contracts, and Department of Commerce points to its services which help industry to secure government work (p. 42).

Engineering News, p. 63 *Market Summary, p. 111*

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STEEL
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Devaluation Pinches Exports

Currency readjustments to bring near-chaos to foreign trade for several months. Long-term outlook may be better. Move expected to shorten Marshall Plan aid period

AMERICAN manufacturers are caught, for the short-term at least, in a two-way pinch by the worldwide currency readjustments set off by England's devaluation of the pound sterling. The long-term outlook, however, may be less gloomy.

After chaos from the readjustments dies, American industry will find: 1. Its foreign market is reduced considerably, for the near-term at least; and 2. an increasing amount of foreign-made goods will flow into the U. S. and compete against U. S.-made products.

Pound Buys Less—Britain's devaluation is an official admission that the pound sterling is worth not 4.03 United States dollars but only 2.80 U. S. dollars. As a British pound now buys less U. S. merchandise the pounds possessed by each English consumer will buy a smaller quantity of goods. The U. S. manufacturer's outlet abroad is, therefore, cut down immediately.

Imports More Competitive — Increased competition in the U. S. from foreign-made goods may come about a little more slowly, for some of the foreign production facilities have not recovered fully from effects of the war. But the devaluation will tend to swell the flow of foreign-made products into the U. S. Here's why: Britain's devaluation permits each pound sterling to be bought for $2.80 instead of $4.03, a 30.5 per cent reduction. Any British-made product priced at one pound sterling, therefore, can be bought for only $2.80 in U. S. money. This is equivalent to a price cut. As the government of England controls prices of products going into export, and will prevent them from soaring, the price advantage is expected to attract additional demand for British-made goods.

Long-Term Outlook

From the long-range viewpoint, the devaluation's effect will be good for the U. S. and the world, say analysts. It should, they remark, help balance world trade and help some of the war-ravaged countries get on their feet financially. Reflecting some of the imbalance in trade, imports into the U. S. have recently been averaging $500 million a month, only half as much as U. S. exports.

Secretary of the Treasury John W. Snyder's comment is that "the immediate effect should be an early rise in Britain's dollar resources, and a long-range result that may be expected is a healthful impetus to worldwide multilateral trade."

May Shorten ERP Period—Another high official in the government told STEEL that in his opinion the devaluation of the British pound should materially shorten the period during which Marshall Plan funds must continue available for economic and other assistance to Europe. He analyzes the situation this way: "We are exporting about $1 billion worth of goods a month and importing half a billion dollars' worth, the gap being made up by Marshall Plan gifts, loans, tourism, remittances and private investments. Devaluation should result in increased imports into the U. S. Thus Europe in time will cease being dependent on us for aid."

May Ease Restrictions—Because international trade has been under highly restrictive controls, the impact of devaluation is expected to be less noticeable than it would have been had these controls not been in play. The devaluation, one official of the U. S. Commerce Department says, should tend to ease some of the restrictions.

This easing would leave it to the higher prices on American goods, in the foreign currencies, to curb the outflow of dollars from the foreign nations. His remarks apply of course to foreign trade in general. "On specific commodities," he points out, "there may be some difficulties; some industries undoubtedly will be affected more than others, either by imports or by competitive conditions in foreign markets, and many will be helped by lower prices on raw materials from abroad."

Europe Can Sell More—Paul Hoffman, head of the Economic Cooperation Administration, believes Europe could "balance her accounts by selling an additional $2.5 billion of goods in the United States—an amount equal to only 1 per cent of the U. S. national income."

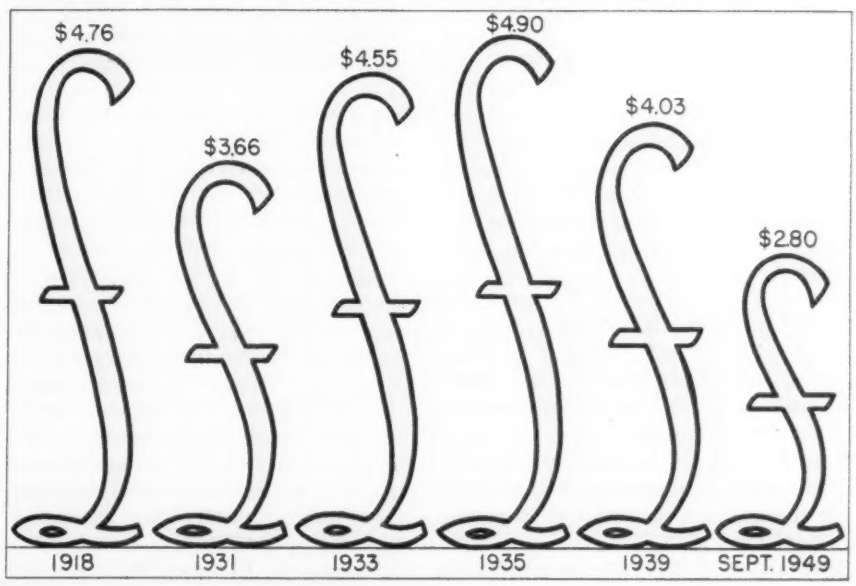
Machinery Market Shrinks

Higher prices to British and Continental buyers, in terms of their devalued currencies, will act as a deterrent to sales of American machinery. Capital goods builders pretty well agree the near-term effect will be reduced foreign buying.

Demand for American machine tools is still large in Europe and this fact together with ECA assistance will tend to minimize the effect of higher prices for American machines, says Tell Berna, National Machine Tool Builders' Association.

Others with their fingers on the pulse of the foreign machinery mar-

Official Dollar-Pound Relation Shows Biggest Shift in 30 Years



ket are more pessimistic. They see an immediate cut in foreign buying since obviously it will be cheaper for Europeans to buy from the British or others with devalued currencies. Where American builders don't already have letters of credit, there may be cancellations.

Machinery import market is not expected to increase because most metalworking companies believe American machines are more satisfactory despite possible price disadvantages.

Exports of machine tools and percentages of total industry shipments in postwar years are: 1946, $87.7 million, 26.2 per cent; 1947, $81.4 million, 26.6 per cent; 1948, $50.8 million, 17.6 per cent; first eight months of 1949, estimated at $37.7 million, 22.4 per cent.

Auto Export Drop Expected

U. S. automotive industry officials look glumly upon effects of devaluation on export sales of American-made automobiles.

Expected is a further decline in U. S. automotive exports, which last year totaled 422,742 units valued at around $1005 million, a decline of 21 per cent from the previous year. Bulk of this country's exports — 117,091 units—went to South America, while European countries purchased only 67,703.

Many Import Restrictions — All countries, except Venezuela, Cuba, El Salvador, Ethiopia, Dominican Republic and Panama, have rigid restrictions on imports of American automotive products, with quotas permitting only the most urgent buying requests to be satisfied. Currency devaluation will have the effect of raising prices of U. S. cars and trucks to even these few importers and demand thus will soften, unless U. S. manufacturers cut prices accordingly.

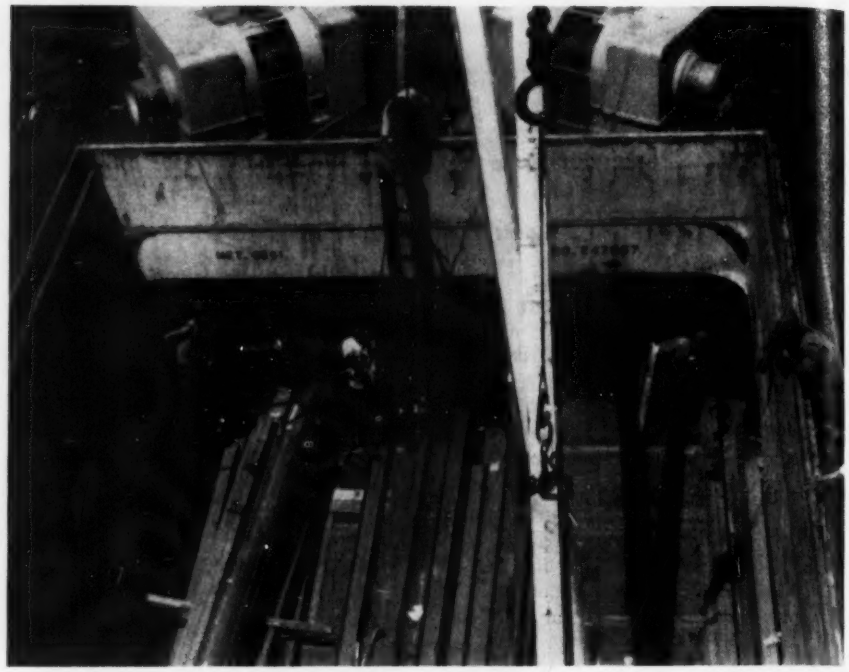
Imports of foreign cars into the U. S. is expected to be affected very little by the devaluation.

British Car Prices Cut—In New York, Fergus Motors announced a 20 per cent reduction in price of British cars "in anticipation of a reduction by manufacturers by that much."

Less Steel To Go Abroad

Devaluation and currency adjustments are expected to reduce steel exports from the United States over the rest of this year.

Mill exports of finished steel in the first six months totaled 1,905,806 net tons, for a monthly average of 317,634 tons. This exceeds the monthly average of 270,407 tons in 1948 when the heavy domestic demand restricted the tonnage available for export.



EXPORT PINCH: Devaluation of the British pound may cut sales of American steel abroad. Shown above are U.S.-made structural steel beams being unloaded at Capetown, Union of South Africa. Photo by Carl McDow

Cancellations Received—Some cancellations of export tonnage already have been received, and more are expected, although they should not be heavy, steel exporters believe. Economic Cooperation Administration orders will stick, as they have been set up with letters of credit, but where transactions have not been covered fully with such credits, a number probably will be dropped.

Some rise in steel imports, which normally are light, may develop. No one looks for any "dumping," however. There may be some increase in importations of pipe and wire products and some of the heavier goods, such as bars and small shapes, but it is not expected to be of alarming proportions. As for sheets, which continue in stringent supply in some grades, little buying from abroad is anticipated for the reason, if for no other, that American quality is generally regarded as being superior.

Sterling Areas To Take Less — Areas expected to take less American steel as a result of devaluation are South Africa, Australia, India and the Near East. South American orders for steel from the U. S. also will be affected, not so much because of any local currency reductions but because of more attractive prices from England and various other countries where devaluation has taken place.

Canada To Continue Buying—Canada's buying of steel from the U. S. should not drop off sharply for these reasons: 1. Her currency depreciation amounted to only 10 per cent; and 2. in any disposition she may have to buy more from other money devaluated countries, England in particular, she will be confronted with important freight charge considerations because of distances involved.

Bolt and nut makers and manufacturers of other metal products, such as valves and fittings, look for a substantial drop in their export business.

May Cut Farm Implements

Devaluation's principal effect on the farm equipment industry will be a reduction of exports from the United States. The change will not increase competition much from imports to the U. S.

Foreign manufacturers will be more competitive in South America and sterling areas, although preference for U. S. goods is expected to be an offsetting factor, says G. C. Hoyt, executive vice president, International Harvester Co., Chicago.

Exports which have accounted for 13 per cent of dollar sales of Oliver Corp., Chicago, are expected to drop sharply as a result of devaluation, says A. W. Phelps, company president. He expects a recovery, however, after the foreign countries attain a better dollar balance.

Some members of the farm equipment industry are less optimistic. One expects devaluation's effects on

prices and costs of shipping and handling to be the equivalent of a 50 per cent increase in its implements to foreign buyers.

R. R. Equipment Affected

Railroad equipment manufacturers will find devaluation a stumbling block in their paths toward foreign business.

Effects of devaluation will be readily apparent in places like South Africa. That country also has devalued its currency, and if it should require locomotives in the future Britain likely will be in far better position to supply them cheaper than U. S. producers since the relationship between South African currency and the British pound is unchanged.

U. S. Product Better—Production of a better product and quicker delivery, however, will be a strong selling point of American manufacturers if the price differential is not too great, one producer believes.

Foreign Ordering Light—Devaluation doesn't mean a thing now to Pullman-Standard Car Mfg. Co., Chicago, but it may later. "There is no foreign ordering now, although we have had some foreign inquiries recently," says A. L. Barry, assistant to the president. Where effects will be felt in the future are South America, India and other countries in which competition from English car builders will be heightened, Mr. Barry believes.

Ores To Cost Less

Lower prices on iron and manganese ore, tungsten and chrome are expected by American importers as a result of devaluations of foreign currencies.

Extent of price decreases depends, importers assert, upon product availability—availability of the material before internal costs abroad begin to rise to a point where devaluation of currency is, in effect, wiped out.

Steep Rock To Benefit

Steep Rock Iron Mines Ltd. is one of the larger beneficiaries of the devaluation of the Canadian dollar, Cyrus S. Eaton, chairman, Cleveland, reveals.

The company delivers its iron ore at Lake Erie ports for $7.50 a gross ton in U. S. money but pays Canadian dollars for all of its expenses, including labor at the mines and railroad freight and charges on three Canadian vessel lines. Premium resulting from the cut in the Canadian dollar is about 75 cents a ton. The company's gain through this means will be about $600,000 this year. The company expects to increase its ore movement next year.

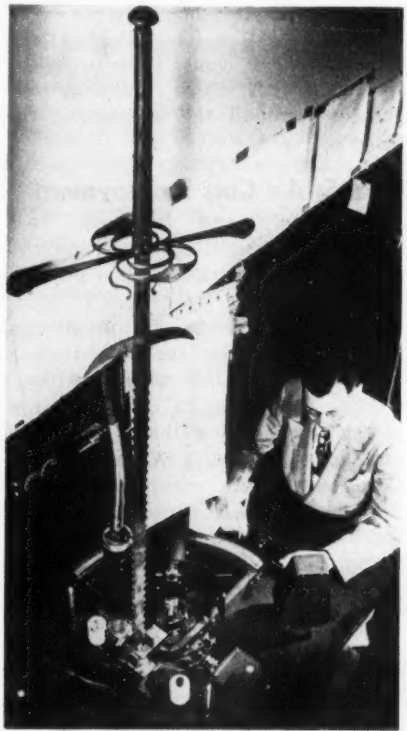
Steel Gains Another Reprieve

Deadline of steel truce extended to Oct. 1 at President's request. Industry and union differ on contributory vs. noncontributory insurance and pension plans

YOU will have to wait a little longer to learn whether the steel wage dispute is to be settled peacefully or whether America's steel mills are to be tied up by strike.

A new deadline faces the steel producers and the United Steelworkers—Oct. 1. President Truman asked, and the industry and union agreed, that the steel truce be extended six days to this date.

Negotiators are scheduled to get together this week and seek a solution to the big problem that is preventing settlement. This problem is: Shall insurance and pension plans be financed entirely by the companies or shall the employees be asked to contribute?



ATOMIC AGE VS. MEDIEVAL: A U.S. Steel Corp. technician uses a Geiger counter to analyze steel forged into a medieval, two-handed sword. Powerful X-rays from vertical tube at left ionize atoms of iron and alloying elements that compose the serrated blade, making them fluorescent. Geiger counter on quarter-circle track identifies and measures intensity of rays. Method of steel analysis, thus far experimental, promises a charted result in one minute; steel needs no special preparation and remains intact

Industry Wants Contributory Plans—Steel producers are insisting that any plans which may be set up should be on a contributory basis. Management believes that workers should contribute to their own security.

Union Says Industry Should Pay All—The United Steelworkers insist that the companies must pay the entire cost of the social security plans.

The fact-finding board supports the union view in its recommendation that the industry's insurance and pension programs should be noncontributory.

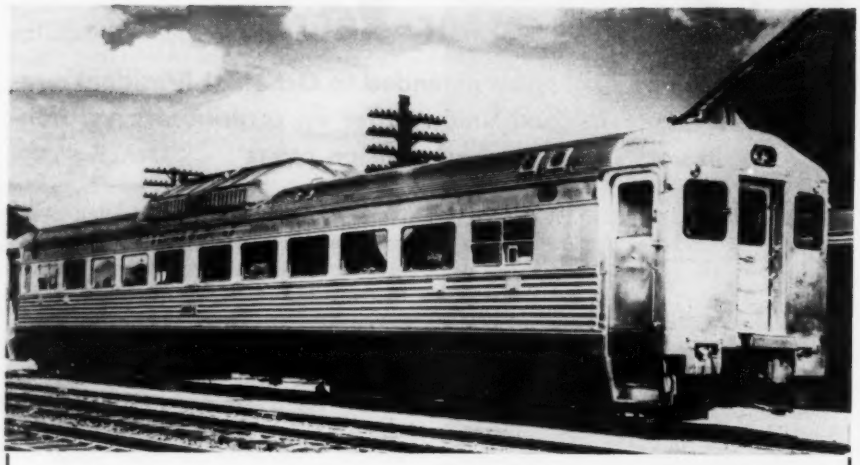
Compromise Possible—Neutral observers suggest a way out. U. S. Steel is willing to pay up to 4 cents an hour for an insurance plan, provided it is a contributory program. Chief objection by the union to contributory plans is that the take-home pay of the workers would be reduced. Why, ask the neutral observers, does not the corporation offer a 2-cent hourly wage increase, which the worker would contribute toward the insurance plan? The company then would contribute 2 cents an hour. The workers would have an insurance plan costing 4 cents an hour. Their take-home pay would not be reduced. The industry would be paying only what they have offered to pay and would be holding to the principle of contributory welfare plans.

Steelworkers Anxious—While union leaders, company management and the government work around Robin Hood's barn toward settlement of the dispute the boys out in the mills are getting anxious. They along with millions of other Americans have been kept on pins and needles all summer. Many are delaying purchases of new cars, refrigerators and other goods until they learn whether or not the pay checks will keep on coming.

Ford Agreement Probable

Possibility of a week-end agreement between Ford Motor Co. and the UAW-CIO in their lengthy negotiations over pensions and insurance was considered good late last week.

Although strict secrecy was being



DIESEL CAR: This all-stainless steel rail diesel car accommodating 90 passengers is the newest development of Budd Co., Philadelphia. The new car is equipped with twin General Motors 275 hp engines, Allison torque converter transmissions, Budd disk brakes and Frigidaire air conditioning. The unit may be used alone or with other cars and is designed for economical operation on short and main line runs

maintained at bargaining sessions last week, in progress day and night, the company reportedly had offered to meet the "10-cent package" recommended by the steel fact-finding board. It would comprise 1¼ cents in the form of group insurance already in force, matched by a like amount paid by employees, plus an additional company-paid 8¾ cents (per man-hour), which would give workers at age 68 something like $55-$70 per month pensions. This, added to social security payments, estimated to range from $30-$45 per month, would bring the total to the desired $100.

Compromise Suggested—The UAW had been asking for pensions to start at age 60, and there was talk of a compromise on 65 years. One source said another union argument sought to have the present 1¼-cent insurance payment exempted from the new offer.

A few other points in dispute remained to be resolved. They cover such subjects as production standards, temporary layoff provisions, farming out of work to outside contractors, committeemen structure and union representation. It was believed agreement on these issues, once the pension matter was finalized, would be routine.

Wants Sound Program—In a statement Sept. 20, the company declared, "real progress has been made" on pension negotiations, but emphasized that efforts were being centered on a plan which would be financially sound, workable and meet the particular needs of Ford workers. Development of such a plan involves the solution of highly technical problems and these would have to follow agreement on basic features, arrived at around the bargaining table, Ford said.

Coal Strike Cuts Employment

"Stay-away" by the soft coal miners is cutting deeply into employment and less seriously into production.

Tens of thousands of railroad employees have been furloughed as a direct result of the miners' strike.

Some reductions in coke and iron production is being made as operators conserve coal. Wheeling Steel Corp. says coke making has been slowed, one blast furnace has been banked, and another is scheduled to be banked. Reduced ironmaking will cut steel production and cause layoffs in the corporation's plants.

No Settlement in Sight—Meanwhile the dispute appears to be far from settlement. Some southern mine operators continue to withhold royalty payments on the ground that no contract exists between the operators and the miners and therefore the operators are under no obligation to pay the royalties.

Northern and western operators generally have been continuing the royalty payments. However, they indicate that specific terms of a new contract must await settlement of the steel wage dispute.

Stocks Fairly Large — Although John L. Lewis has been restricting mine operation to three days a week this summer to cut down stocks of coal above ground, inventories of most industrial users are still large. Total stockpile is 65 million tons.

Latest figures by the Bureau of Mines indicate that industrial stocks average 83 days. Steel and rolling mills have 75 days' supply, coke ovens 61 days' supply and railroads have about 54 days' stocks.

Benefit Payments Suspended — Sharp reduction in royalty payments into the miners' welfare fund, caused in part by the short work-week, has practically exhausted the fund. A week ago, Mr. Lewis suspended all payments from the welfare fund.

Leftists Hold UE Control

Left-wingers held control of the United Electrical Workers-CIO by re-electing a full slate of officers at the union's convention in Cleveland last week.

This week the left-wingers will meet in New York to formulate a campaign against General Electric and Westinghouse. Some labor observers believe the left-wingers will attempt to stage a strike against both companies, thereby crippling production of much of this country's vital defense work.

Albert J. Fitzgerald, president of the UE since 1941, was re-elected president; Julius Emspak continues as secretary-treasurer; James J. Matles was renamed director of organization.

Right-Wingers Defeated—An attempt by right-wing elements in the union to regain control was turned into a complete rout. The conservatives were directed by James B. Carey, vice president of the Congress of Industrial Organization and former president of the UE.

Encouraged by their re-election, the left-wingers indicated they will call for a showdown with the national CIO officers on policy.

Leland Electric To Move

Leland Electric (Canada), Guelph, Ont., will move out of Guelph, says President Ernest G. Robertson. The company closed its gates after the United Electrical Workers—CIO struck for wage increases.

Plant Will Reopen

American Radiator & Standard Sanitary Corp.'s Pittsburgh plant, closed since Apr. 29, will reopen immediately. More than 700 men will return to work. Company's other plants located in Buffalo, Baltimore and Bayonne, N. J., which were also closed, reopened earlier this month.

Several months ago Theodore E. Mueller, American Standard's president, announced the plant would not reopen because of high production costs. After company-union conferences terms for the plant's reopening were worked out and a new rate structure established on certain jobs.

Steel Increase Mild

Base prices have risen less than half as much as wages, new composite shows

YOUR base costs for steel have advanced less in the last decade than have the costs of most other commodities. The rise in steel prices has been only half as great as the rise in food and less than half the advance which has occurred in steel wage rates.

These facts are disclosed by a comparison of STEEL's new weighted steel price composite with indexes of other commodity prices and wages. The new steel price composite (see page 112) more accurately reflects changes in steel prices than those previously published.

Steel Up 52.5 Per Cent—August base steel prices were 52.5 per cent higher than they were in the base period of 1935—1939, most widely accepted base for computing price indexes.

The composite price index includes 14 leading steel products, which account for more than 80 per cent of total finished steel production. Each product is weighted on the basis of tonnages sold during the 1935-1939 base period.

Extra charges are not included in the composite. Extras vary so much as to make their inclusion impracticable.

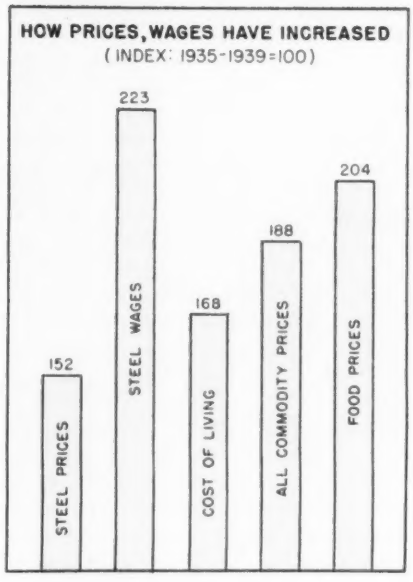
Wages Advance 123 Per Cent — Hourly earnings of steelworkers are up 123 per cent over the base period. During 1935-1939, hourly earnings averaged 76.3 cents. In July, the average steelworker's earnings amounted to $1.699.

Cost of Living Up 68.5 Per Cent—The index of consumers' prices, more commonly known as the cost of living, now stands at 168.5 per cent of the base period. The high point in living costs was reached in August and September, 1948, when the Bureau of Labor Statistics' index touched 174.5.

Food Advances Less than Wages—Food prices have made the largest advance in the commodity field and are 104.3 per cent higher than in the base period. The advance in food prices is still less than the increase in hourly wages.

Other Commodities Up—The index for all commodities, as compiled by the Department of Commerce, is 88.3 per cent above the base period. House furnishings have increased 87.3 per cent. Apparel costs are up 90.3 per cent.

Accompanying chart shows latest indexes of steel wages and commodity prices; baseline of chart is equal to 100.



Malleable Founders Make Movie

MALLEABLE Founders' Society is introducing "This Moving World," a 16-mm, 30-minute film demonstrating how malleable castings are made and used.

The audience is taken into the foundry and shown its operation. Displayed are uses of malleables in automobiles, railroad cars, farm implements, plumbing and electrical parts and for other purposes.

The movie will be shown to technical societies, students, customers of the industry, business groups, clubs and others. Inquiries from groups interested in seeing the film may be addressed to the society at 1800 Union Commerce Bldg., Cleveland.

Marshall Steel Co. Moves

MARSHALL Steel Co. has moved from Lisle, Ill., to its new plant in McCook, Ill., just outside of Chicago.

Expanded facilities enable Marshall to give more complete service in production of water, oil and air quenched ground flat tool steel. The company is now better equipped to produce special precision grinding jobs on shear blades, wear plates, machine parts and other products.

Phosphor Bronze Corp. Sold

FOUNDRY and all foundry equipment of Phosphor Bronze Corp., Philadelphia, has been sold by A. Jay Hoffmann Co. to a syndicate which will continue to operate the 75-year-old business.

The company's line of nonferrous castings and products will be expanded to include aluminum castings. A new corporation is being formed,

Steel Ingot Production Statistics

	Estimated Production—All Companies									
	Open Hearth		Bessemer		Electric		Total		Calculated weekly production	Number of weeks in mo.
	Net tons	Per Cent of capac.	Net tons	Per Cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	
1948										
Jan.	6,770,831	95.6	343,263	77.5	366,784	80.2	7,480,878	93.7	1,688,686	4.43
Feb.	6,247,491	94.4	340,689	82.3	359,837	84.2	6,948,017	93.1	1,678,265	4.14
Mar.	6,845,777	96.6	363,334	82.0	409,659	89.6	7,618,770	95.4	1,719,813	4.43
1st qtr.	19,864,099	95.5	1,047,286	80.6	1,136,280	84.7	22,047,665	94.1	1,695,974	13.00
Apr.	5,640,273	82.2	185,140	43.2	399,074	90.1	6,224,487	80.5	1,450,929	4.29
May	6,801,633	96.0	355,659	80.3	423,350	92.6	7,580,642	94.9	1,711,206	4.43
June	6,484,114	94.5	356,907	83.2	424,228	95.8	7,265,249	94.0	1,693,531	4.29
2nd. qtr.	18,926,020	91.0	897,706	69.0	1,246,652	92.8	21,070,378	89.9	1,619,552	13.01
1st 6 mos.	38,790,119	93.3	1,944,992	74.8	2,382,932	88.8	43,118,043	92.0	1,657,749	26.01
July	6,348,611	89.8	325,080	73.6	401,826	88.1	7,075,517	88.8	1,600,796	4.42
Aug.	6,633,443	93.6	371,306	83.8	442,085	96.7	7,446,834	93.3	1,681,001	4.43
Sept.	6,594,499	96.3	387,259	90.5	443,086	100.3	7,424,844	96.2	1,734,777	4.28
3rd. qtr.	19,576,553	93.2	1,083,645	82.6	1,286,997	95.0	21,947,195	92.7	1,671,530	13.13
9 mos.	58,366,672	93.2	3,028,637	77.4	3,669,929	90.8	65,065,238	92.2	1,662,372	39.14
Oct.	7,120,753	100.5	409,657	92.5	466,485	102.0	7,996,895	100.1	1,805,168	4.43
Nov.	6,925,043	100.9	411,161	95.9	461,354	104.2	7,797,558	100.8	1,817,613	4.29
Dec.	6,927,689	98.0	393,717	89.1	459,373	100.7	7,780,779	97.7	1,760,357	4.42
4th qtr.	20,973,485	99.8	1,214,535	92.5	1,387,212	102.3	23,575,232	99.5	1,794,158	13.14
2nd 6 mos.	40,550,038	96.5	2,298,180	87.5	2,674,209	98.6	45,522,427	96.1	1,732,867	26.27
Total	79,340,157	94.9	4,243,172	81.2	5,057,141	93.7	88,640,470	94.1	1,695,495	52.28
1949										
Jan.	7,287,683	101.1	408,552	92.6	487,260	93.8	8,183,495	100.2	1,847,290	4.43
Feb.	6,633,779	102.0	379,698	95.3	467,247	99.6	7,480,724	101.4	1,870,181	4.00
Mar.	7,473,901	103.7	430,176	97.5	483,850	93.2	8,387,927	102.7	1,893,437	4.43
1st qtr.	21,395,363	102.3	1,218,426	95.2	1,438,357	95.4	24,052,146	101.5	1,870,307	12.86
Apr.	7,015,611	100.5	404,095	94.6	365,570	72.7	7,785,276	98.4	1,814,750	4.29
May	6,889,230	95.6	400,741	90.9	299,751	57.7	7,589,722	92.9	1,713,256	4.43
June	5,954,619	85.3	349,196	81.8	194,386	38.6	6,498,201	82.2	1,514,732	4.29
2nd qtr.	19,859,460	93.8	1,154,032	89.1	859,707	56.4	21,873,199	91.2	1,681,260	13.01
1st 6 mos.	41,254,823	98.0	2,372,458	92.1	2,298,064	75.8	45,925,345	96.3	1,775,236	25.87
*July	5,307,469	73.8	300,236	68.2	171,415	33.1	5,779,120	70.9	1,307,493	4.42
†Aug.	6,111,214	84.8	355,335	80.6	244,271	47.0	6,710,820	82.2	1,514,858	4.43

* Revised. † Preliminary figures subject to revision.

For 1949, percentages of capacity operated are calculated on weekly capacities of 1,626,717 net tons open hearth, 99,559 net tons bessemer and 117,240 net tons electric ingots and steel for castings, total 1,843,516 net tons; based on annual capacities as of Jan. 1, 1949, as follows: Open hearth 84,817,040 net tons, bessemer 5,191,000 net tons, electric 6,112,890 net tons, total 96,120,930.

but the original personnel of Phosphor Bronze will be retained.

Zinc Die Castings Certified

AMERICAN Die Casting Institute, New York, is inaugurating a certified zinc alloy plan to identify zinc die castings which meet the institute's specifications and quality standards.

Producers subscribing to this plan may label all their castings with the institute's certification seal. Under the program, frequent samplings of castings from all participating producers will be taken for analysis by an approved laboratory.

All Bin Contracts Awarded

COMMODITY Credit Corp. has let contracts to construct 59,120 bins for storing 280,316,840 bushels of grain.

This capacity awarded to date, together with 45 million bushels of storage capacity previously on hand, will provide sufficient storage to meet currently known needs. CCC is prepared, from offers now on file, to make additional purchases if requirements rise.

Shipyard Observes 100th Year

SAN FRANCISCO yard of Bethlehem Steel Co.'s Shipbuilding Division is observing its 100th anniversary.

Founded by two brothers, James and Peter Donahue, in 1849 as a small smithy, Union Iron Works as it was first called did miscellaneous metalworking until 1884 when it entered the shipbuilding field. To date, it has built well over 500 vessels of all types, including 146 combat ships for the U. S. Navy which served in the Spanish-American conflict and both World wars. In the early days of its history, the firm turned out the first steel casting in California, built machinery for the first naval vessel constructed on the West Coast and in 1864 completed the first standard gage locomotive to be built in the West.

Union was sold to United States Shipbuilding Co. in 1902. Bethlehem purchased the yard in 1905. Since 1945 the facility has devoted itself almost exclusively to the repair and conversion of vessels of all types.

"Bill" Jack Builds Coast Plant

NEW laboratory and plant for the development of supersonic aircraft instruments is being built near San Diego, Calif., by William S. Jack, wartime head of Jack & Heintz Co., Cleveland.

A 30,000-square foot plant at Solana Beach is scheduled to begin operations in October, and will employ 600 at peak output.

Large Tube Test Program

LARGE program of hydrostatic tube and pipe testing installations is being carried out by Hydraulic Division, Hydropress Inc., New York. Several of the 13 installations which comprise orders from Kaiser Steel Corp., National Tube Co., Page-Hersey Tubes Ltd., Republic Steel Corp., Wheeling Steel Corp., Armco International Corp. and some foreign orders, have already been delivered.

Cleaner Sales Make Sharp Gain

FACTORY SALES of standard-size household vacuum cleaners totaled 219,909 units in August, up 35.7 per cent over July's 161,920 and off 7.3 per cent from August, 1948, sales of 237,202. Vacuum Cleaner Manufacturers' Association, Cleveland, says the eight-month total for 1949 is 1,844,929 cleaners, a drop of 18.7 per cent from 2,270,132 in same period of last year. Sales for this year, however, are 60 per cent above those in same period in 1941.

Handling Show Planned for 1951

MATERIAL Handling Institute, Pittsburgh, has dropped plans for a 1950 exposition, but will hold one instead in the spring or fall of 1951, probably in Chicago.

Plant For Sale

WALZ & KRENZER Inc., Rochester, N. Y., is offering its plant for sale after losing a court battle for rezoning of its property. The tool and die firm plans to continue operations at a new location, as yet unselected.

OBITUARIES . . .

Elmer L. Lipman, 56, secretary-treasurer and member of the board of directors of Inland Steel Products Co., subsidiary, Inland Steel Co., Chicago, died at his home in Milwaukee, Sept. 17 after a brief illness. He joined the company in 1929 and in 1938 was appointed secretary-treasurer of the company, which at that time was known as Milcor Steel Co. Mr. Lipman was a tax investigator for the United States treasury department from 1920 to 1929.

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Walter S. Going, 65, vice president, Continental Gin Co., Birmingham, died of a heart attack Sept. 18. He became associated with Continental Gin in 1904, and for years traveled for the company in India, South America and Africa.

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John L. Banner, 62, who retired about two years ago as president, Thomas B. Banner Boiler & Welding Co., Chicago, died Sept. 17. At the time of his death he was secretary of the Chicago Boiler Manufacturers Association.

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William R. Cox, 48, president, W. R. Cox Steel Co., Chicago steel warehouse, died Sept. 16.

—o—

Matthew J. Dorcic, 53, vice president, BDN Steel Erecting Co., Chicago, was killed Sept. 15 in a construction accident in Chicago Heights, Ill.

—o—

William C. Henning, president, A. Leschen & Sons Rope Co., St. Louis, died Sept. 6.

—o—

Louis M. Brownell, 63, president, L. M. Brownell Co., Cleveland, industrial management consultant, died Sept. 15. He was formerly president, Seeley Tube & Box Co., Denville, N. J.

—o—

James H. Spade, 58, consulting metallurgist, died Sept. 12 in Los Angeles. He was district sales manager for Allegheny Ludlum Steel Corp. and a charter member of the American Society for Metals.

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Edwin C. Auld, 45, sales engineer in Los Angeles for the last 13 years for Jaeger Machine Co., Columbus, O., died Sept. 5.

—o—

Henry B. Greensted, 68, metallurgical consultant with Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont., Canada, died Sept. 1. He joined the company as chief chemist. After World War I the company entered the field of alloy steel production, pioneering this development in Canada, and Mr. Greensted was active in necessary research and experimentation in this production. For his efforts he received an award from the American Society for Metals in 1948. An injury forced him into semi-retirement in 1947, but he continued as metallurgical consultant for Algoma.

Machinery on Time

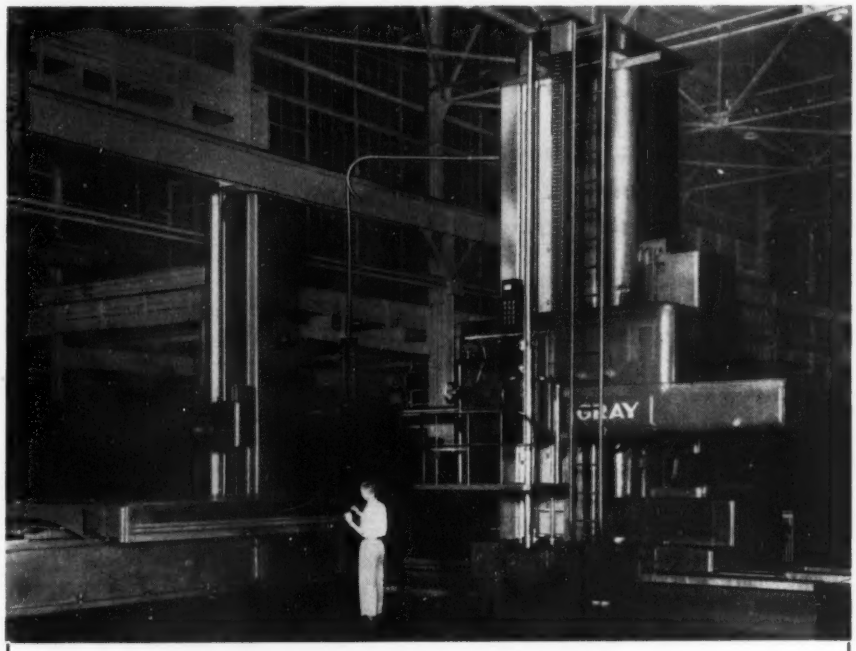
Installment plans, with 25 per cent down, offered by E. W. Bliss and American Wheelabrator

DEFERRED payment plan on all types of presses produced by E. W. Bliss Co., Toledo, O., is being made available to the company's customers. Bliss terms heretofore have been restricted to net cash or 30 days.

Under the plan buyers of Bliss machinery can elect to defer payments over a period from one to three years by making a 25 per cent initial payment. Interest is charged at the rate of 6 per cent only on the unpaid balance. Thus the average interest costs for one year amount to 3¼ per cent on the original deferred sum and there are no financing charges.

E. A. Irwin, Bliss sales manager, says the plan was devised to accommodate customers seeking to modernize pressroom equipment without affecting regular banking credit and those who want to retain capital for other uses.

American Wheelabrator & Equipment Corp., Mishawaka, Ind., has a similar plan in effect on its blast cleaning equipment, dust collectors and sand cutters. Initial outlay for equipment is 25 per cent of total cost. Payments may be made under 6 to 12, 15, 18, 24 and 30 month plans. Simple interest is charged starting with 4 per cent for the first plan and increasing in increments of 0.5 per cent up to a maximum of 6 per cent for the 30 month plan. The company has prepared a bulletin giving details of the cost financing varying loans under the several plans being offered.



MACHINE TO CREATE PRESSES: Example of a machine tool as a "machine which makes machines" is this 175-ton planer-type drilling, boring and milling machine. "Designed around" the huge parts which it will drill, bore and mill, this industrial giant has been built by G. A. Gray Co., Cincinnati, for Hydraulic Press Mfg. Co., Mount Gilead, O.

August Tool Orders Better

New orders for machine tools curved upward in August fulfilling industry predictions that a mild upswing was forthcoming following July's postwar low. The new orders index of the National Machine Tool Builders' Association was 51.4 in August, compared with 48 in July and 73.7 in August, 1948. Foreign orders index advanced to a four-month high of 18.7 from 14 in July.

Shipments rose more rapidly than new orders and reached an index figure of 68 in August, above July's 60.7 but short of the 69.8 reached in August a year ago. The improvement in shipments caused the ratio of unfilled orders to shipments to fall to 3.7:1 from 4.4:1 a month earlier.

Association's indexes are based on average monthly shipments in 1945-1947 equaling 100. Average annual shipments in the base period were $355 million.

Productivity Hampered

Productivity is being hampered and costs are being raised by misconceptions on the part of management and labor, says Tell Berna, general manager, National Machine Tool Builders' Association.

Just because machines are in good running order does not mean American industry is marvelously equipped, Mr. Berna believes. Many plants have machines made obsolete by postwar models and represent high-cost operation today. Delay in replacing the old machines with modern equipment that turns out more work is a costly perpetuation of inefficiency, he told a Philadelphia regional meeting of the American Society of Tool Engineers.

Labor's misconception is that new and better machines throw people out of work. History shows that employment and wages rise in direct proportion to multiplied productivity, Mr. Berna points out.

Amertool Files with FTC

Amertool Services Inc., Cincinnati, has filed papers with the Federal Trade Commission under the Export Trade Act (Webb-Pomerene law) for exportation of machine tools and related equipment. Purpose of Amertool in qualifying as a Webb-Pomerene association is: 1. To trade in machine tools and machinery export, 2. to promote sales and engineering services in foreign countries for the products of the members and 3. to provide for the extension of credit to purchasers of machine tools and related equipment, particularly in Latin America.

Export Trade Act provides that nothing contained in the Sherman act shall be construed as declaring to be illegal a co-operative or association entered into for the sole purpose of engaging in export trade. But, there must be no restraint of trade within the U. S., restraint of export trade with a domestic competitor or any artificial or intentional enhancement or depression of prices in U. S.

New Owner for Hisey-Wolf

Cincinnati Electrical Tool Co., division of R. K. LeBlond Machine Tool Co., Cincinnati, is the new owner of Hisey-Wolf Machine Co., same city. Production of the Hisey-Wolf line of industrial grinding machines and buffing and polishing lathes will be continued under the old trade name but operations will be moved to the new owner's plant.

Addition of the more than 200 models acquired as a result of the purchase will enable Cincinnati Electrical Tool to meet the complete equipment requirements of the grinding, buffing and polishing industry, says R. K. LeBlond, president.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Improvements in business and fiscal conditions minimize chance of Congressional action to increase corporate and individual income taxes early next year

FEARS of a substantial increase early next year in income taxes on corporations and on individuals in the middle and upper income brackets have been allayed somewhat as a result of improvements in the fiscal picture over the past few weeks. This favorable change stems from two main developments—the recent improvement in business, and the action of the Senate in wielding the hatchet on appropriations.

Earlier this year the Ways and Means Committee staff foresaw a deficit in the fiscal year ending June 30, 1950, of around $3 billion. It based this estimate on the President's budget requests of $41.9 billion for this fiscal year, and on an assumption that the business decline would reduce the national personal income by the first half of 1950 to an annual rate possibly as low as $198 billion.

Estimate Inaccurate — On both counts the estimate is not working out. First, the last published figure, for June, showed personal income at the rate of $213 billion—and the reversal in the business trend gives promise that the rate now is substantially higher.

Then, the Senate has cut cash appropriations $1.7 billion from the original budget requests, and has slashed authorizations by an additional $1.3 billion. This saving will be reduced by the appropriation for military aid for Europe and certain other items now in the mill; the total for these may be as high as $1.5 billion. That would still leave a saving of $1.5 billion.

Assuming that most of the economies voted by the Senate and the House will stand up in conference, it becomes apparent that the situation has changed for the better since Chairman Doughton of the Ways and Means Committee on Aug. 22 talked somewhat pessimistically on the prospects for tax legislation next year. At that time the possibility of a large deficit in this fiscal year was still much in his mind. He said that the committee early in 1950 would consider reductions in excise taxes which are "crippling enterprise and interfering with business expansion," but at the same time he warned that any such reductions must be "made up by additional revenue from other sources."

Politics Rule Out Tax Boost—Another reason why the prospect for a tax increase next year seems more remote is the political one; some exceedingly important election contests will be held next November.

The study of what should go into a possible tax bill next year is being carried on by the Joint Committee on Internal Revenue Taxation and the Treasury Department's tax research staff. These groups are to submit their reports to the Ways and Means Committee in January.

Industry's "Lend-Lease" of Personnel to U. S. May Be Out

SENATE refusal to confirm Carl A. Ilgenfritz as chairman of the Munitions Board reverses a government policy widely practiced in wartime of obtaining "dollar a year" men from industry. The reversal could have far-reaching effects on the extent to which industry—by lending its top officials—participates in government activities affecting it.

The Senate's action on Mr. Ilgenfritz, vice president in charge of purchases for U. S. Steel Corp., stems from principle, not from disapproval of qualifications which were termed "unquestionably excellent."

Mr. Ilgenfritz's salary from U. S. Steel is $70,000 annually. The salary of the Munitions Board chairman, who directs advance planning for nationwide industrial mobilization in event of war, is $14,000. Accepting the latter and foregoing the former would force him to lose pension and other benefits. Mr. Ilgenfritz offered to waive the government stipend if he could continue his U. S. Steel salary. The Senate position, expressed by Sen. Harry F. Byrd (Dem., Va.) who led the opposition, is: "We haven't got down to the point where we must have government positions subsidized by outside interests."

Secretary of Defense Louis Johnson was surprised at the Senate's action. He says he has no one else in mind to fill the chairmanship vacant since June 22 when Donald F. Carpenter resigned to return to his job with E. I. du Pont de Nemours & Co.

Government Employment Falls

FOR the second successive month Sen. Harry F. Byrd's Joint Committee on Nonessential Federal Expenditures reports a decrease in civilian employment by the U. S.

In June there was a decrease of 5500 and in July of 12,289, but the effect is not too important since employment at the end of July still was 2,102,144 individuals. The drop in employment was due to dismissals of industrial employees at Navy and Army shore installations. Other agencies of the government during July increased their total number of employees by 4990. The civilian payroll cost of the government, the committee reports, was $6,516,063,000 in the fiscal year ended June 30, an increase of 14 per cent from the preceding fiscal year.

Defense Names Buying Aides

DEPARTMENT of Defense is broadening its program of aiding small business in procuring armed forces contracts.

Liaison officials in every buying department of Defense will arrange for businessmen to communicate with the appropriate person in procurement offices. A list of the officials is available from the Department of Defense, Office of Public Information, Washington 25, D. C.

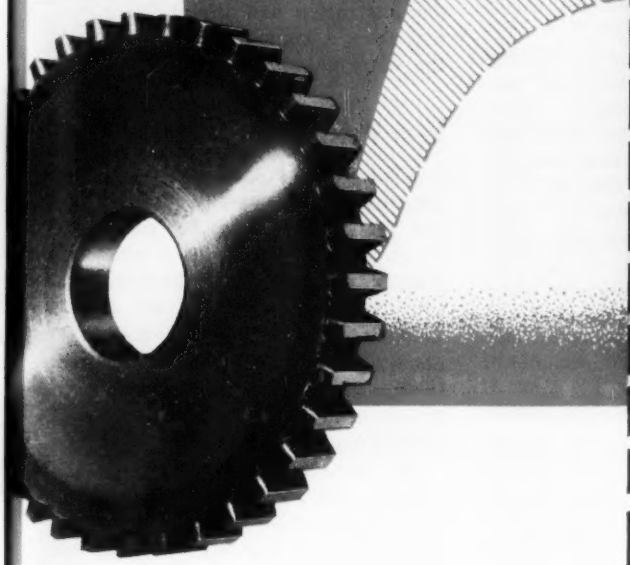
The Defense Department's adviser on small business is D'Alton B. Myers, Munitions Board, Office of Procurement Methods. At the Central Military Procurement Information Office, Army's representative is Capt. Agnes A. Mashidlausky; Navy's is Lt. Joan E. Flickinger; Air Force's is Major Sid F. Spear.

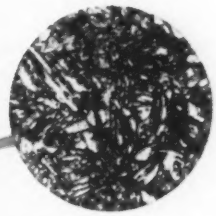
How To Get Government Work

JUDGING from inquiries received from STEEL's readers, many are unaware of the existence of the Commerce Department's fine book entitled "Government Procurement Manual." This 300-page volume is invaluable to

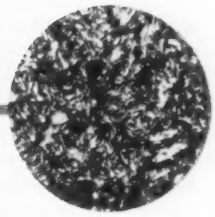
specified

definite hardness pattern in C-1050 spur gear teeth; surface hardness Rc63; distortion next to nothing





structure at corner of tooth; Rc 63



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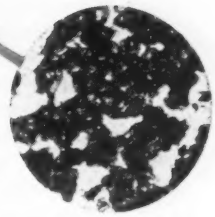

structure at transition zone (all x-600; 2% nital etch)

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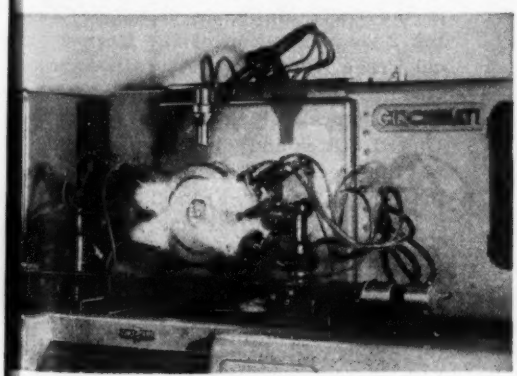
by Flamatic selective surface hardening

With Flamatic hardening, you get the hardness values you want, where you want them, part after part, **fast**—and for less money. The spur gear shown above illustrates the accuracy with which Flamatic hardening can meet difficult specifications. It is one of many types of parts (gears up to 18" OD, shafts up to 24" long) Flamatic hardened by Pittsburgh Commercial Heat Treating Co., Pittsburgh, Pa., **right** to the customer's specs. Flamatic's rapid heating confines heat to desired areas, and electronic temperature control holds surface temperature to a pin point (plus or minus 5°F.)—insures desired results every time . . . If surface hardening can make your product better, chances are Flamatic can make it **better for less money.** Send us a part print for recommendations, or write for booklet of case histories.

Cincinnati Flamatic hardening machine processing spur gears at Pittsburgh Commercial Heat Treating Company.



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any company trying to get work from the government. Its various sections cover all of the 65 procurement divisions of 20 government departments, stating where the buying offices are located, what they buy and how they buy it, and the names of the procurement officers to be contacted.

Copies of the manual are to be found in all the Commerce Department field offices and in the offices of many chambers of commerce, boards of trade, trade associations and other public and business interest groups. At the Commerce field offices, located in 42 cities (Pittsburgh, Cleveland, Chicago, Detroit are some), visitors not only can make notes from the manual but can get much supplementary information by asking questions of qualified employees. All these offices are informed about what can be obtained from the President's "spot assistance" program for distressed businesses and areas.

An unsatisfactory feature about this "Government Procurement Manual" is that copies of it cannot be purchased. It was made in looseleaf form so that as fast as changes occur corrected sheets must be inserted in all the copies. This kind of service is expensive for the Commerce Department. It takes a full-time staff of 8 to 10 persons under B. K. Slaughter, chief of the Procurement Program, Small Business Division, to keep current copies of the book up-to-the-minute.

If there is sufficient demand, arrangements may be made sometime in the future to put a price on the book, and a yearly fee for keeping it corrected. At present, some 350 copies have been distributed.

Faster Action in Mines Bureau

FIRMS and individuals having business with the Bureau of Mines should get faster and much more satisfactory action hereafter as a result of the reorganization of that agency.

Each regional office now is fully autonomous within its area, and empowered to make decisions without reference to Washington. The country has been divided into seven regions with headquarters at Pittsburgh; Albany, Ore.; San Francisco; Denver; Minneapolis; Bartlesville, Okla.; and Tuscaloosa, Ala. Another region has been set up for Alaska, headquarters at Juneau. A ninth region is the Foreign Minerals Region, including all the bureau's minerals activities in foreign countries.

The old Washington setup with six divisions has been abolished and succeeded by one with three commodity divisions. These are Fuels and Explosives, co-ordinating activities in coal, petroleum, synthetic fuels, helium and explosives; Minerals Division, co-ordinating work in ferrous metals, nonferrous metals, light metals, precious and rare metals, fertilizer minerals and construction minerals; and Health and Safety Division.

J. H. Hedges has been brought from the Tucson, Ariz., Experiment Station to become chief of the Minerals Division. J. J. Forbes will continue as chief of the Health and Safety Division. Arno C. Fieldner will continue as chief of the Fuels and Explosives Division.

Director Boyd also is appointing a staff of top advisers to direct the development of fundamental engineering and scientific projects and assist him in steering overall policies of the bureau. E. D. Gardner has been designated chief mining engineer. Oliver C. Ralston has been named chief metallurgist. Still to be appointed are a chief economist, chief of air and stream pollution research and a chief counsel.

U.S. May Buy Stockpile Aluminum

ALUMINUM & Magnesium Advisory Committee, Munitions Board, recommends that the Munitions Board purchase aluminum for the stockpile. Aluminum is now on the board's group 2 list of materials which are not recommended for purchase, but which are kept under study.

Industry spokesmen believe that the board could obtain 150 million pounds of aluminum for the stockpile in fiscal 1950 without adversely affecting the domestic economy. That figure would include 24 million pounds which the General Services Administration has agreed to accept from Reynolds Metals Co. and 36 million pounds from Permanente Metals Corp. Reynolds is delivering the aluminum in lieu of rent on a government plant it leases. Permanente is delivering the aluminum in part payment for a government plant it has purchased.

'National Minerals' Bill Pressure

MAIN pressure behind action of the Senate Committee on Interior and Insular Affairs in reporting favorably the O'Mahoney "national minerals" bill came from interested industry.

Under the bill miners would receive two kinds of financial handouts from a Minerals Conservation Board headed by the secretary of the interior: One for encouraging exploration for critical and strategic minerals, another to prevent abandonment of pumping at high-cost mines. Flooding results in irreparable loss of the metals involved: mainly copper, lead and zinc; on a smaller scale, tungsten and some others.

Capitol observers think the bill, identified as S. 2105, has small chance of enactment since it will be opposed by senators from eastern, midwestern and southern states on two grounds: First, that it has been impossible to make any reliable estimates about how many millions would be required to finance the program; second, that it would give the administration new life-or-death control over a considerable segment of the marginal mining industry.

War Powers Bill Shelved

A GLANCE at the recently-revised Emergency Powers bill explains why the White House has not attempted to get it enacted at this time; the wartime powers which the bill would confer on the President are so all-inclusive that it would stand no chance of being enacted by Congress in time of peace even if it were clearly earmarked as legislation to be held in standby for another war.

The product of many government and private legal experts, who have been working on it for the past 18 months under the authority of the National Security Resources Board, it wraps into one package all the wartime powers that would be needed by the President.

The bill, subject to any further changes that might be deemed wise from time to time, will continue to be held by the NSRB.

Tariff Revisions Coming

FIRST important tariff revision news in the wake of Senate clearance of the 2-year extension of the Reciprocal Trade Agreements Act will come when the President acts on the agreements tentatively accepted by the United States and 10 foreign powers at the recent international trade meeting at Annecy, France.

Now that Congress has acted favorably on the administration bill and freed the President of all curbs, he is in a position to make the Annecy agreements effective merely by proclamation. The proclamation, to be issued early in October, will announce tariff cuts on more than 400 commodities. The 10 countries with which agreements were reached at Annecy are Denmark, Finland, Italy, Greece, Sweden, the Dominican Republic, Haiti, Liberia, Uruguay and Nicaragua.

New Competitive Edge for Britain?

Unexpectedly sharp devaluation of the pound gives pause even to those European nations favoring cheaper sterling; sends them to refiguring relative marketing positions

WESTERN European nations in the race for recovery are refiguring their relative positions as the weight cut from the English pound promises to give Britain a new competitive edge.

Belgium, France and Italy, heavy buyers of British manufactured goods and strong proponents of the pound devaluation, now wonder if they have advised too well. Unexpected was the drastic cut from $4.03 to $2.80, five cents below what the pound has been bringing even on the black market. Consensus had been that if Britain devalued at all, about $3.20 would be the lowest she would go. Nations favoring devaluation thought they would still be competitive at that level.

Heavy Drag—Indicative of the unusually heavy drag caused by the severe pound revaluation is the number of countries outside the British Commonwealth which have also pegged their currencies down several notches. Ireland, France, Egypt, Israel, Denmark, Norway, Sweden, Iceland, Finland and Holland have cheapened their money. Some of these might have stayed pat had the British action been less stringent. The chain reaction set off in the United Kingdom may bring currency revaluations in 30 commonwealth and other nations. There is speculation in financial quarters that several Latin American countries doing business with Britain will devalue.

Press and popular reaction in Britain to devaluation ranges from tepid to icy. The French will permit the franc to seek its own level in a free market, which means a slight devaluation from 330 to about 350 francs to the dollar. Strongest pessimism outside the U.K. comes from Western Germany which expects near-ruinous competition now from Britain.

Labor Strife Threatens U. K.

A new threat of industrial chaos and inflation hangs over Britain in the wake of the 30 per cent slash in the dollar value of the pound. Industry spokesmen admit that exports may be boomed by the action, but they point out that a much greater volume—some estimate as high as 50 per cent more than the current annual rate—will have to be shipped overseas to take up the slack.

That this much more can be produced is a question, particularly in the light of new labor walkouts. Despite government appeals to hold the wage line, railway workers started a slowdown at Southampton Sept. 20 to back demands for a $1.40 pay raise. More slowdowns and walkouts appear inevitable. Leaders of the Trades Union Congress met last week in the first of a series of sessions to decide whether the TUC can continue to support the government's wage freeze order. There are indications that the union bosses are split among themselves and that a segment of the congress might defy the government. The TUC is the backbone of Britain's ruling Labor party.

U.K. steel production continues at a record rate and will surpass the all-time high output in 1948. August ingot and castings annual rate was 16,448,300 net tons, compared with 15,528,700 tons in August, 1948, and 13,966,700 tons in July. Export quotas for the fourth quarter are certain to be increased. All the plates and sheets that can be made could be sold abroad, and the pound devaluation is expected to boom foreign demand for bars and light rails, previously being undersold abroad by German, Belgian and French producers.

Major markets for British iron and steel products are Australia, South Africa, Iran and the Netherlands in that order. New value of the pound is expected to attract Argentine and Canadian business, particularly. Britain is stepping up imports on semi-finished steel, chiefly from Belgium, to boost its production of finished products.

LAUNCH-HOUR: The "Genepesca I" is launched in the Free Territory of Trieste Shipyards, the first of six ocean-going fishing ships to be built with Marshall Plan help. An Italian fishing company will use it to fish in the waters off Newfoundland. The catch will be processed for Austrian and German markets. NEA photo

Free Currency for France?

France began the road back to free currency trading last week by dropping all controls on dollar dealings, a move that will devalue the franc slightly. The shift may have strong economic influences on French exports for a free currency favors foreign trade.

Government officials expect the franc to slide about 6 per cent to a rate of 350 to one dollar. The present exchange is 330 to one dollar. While the franc-dollar rate will be permitted to fluctuate with market demands, the French cabinet kept controls over dealings with the British pound. It set a pegged rate of 980 francs to the pound. This is a stronger position than the previous exchange of 1070 to the pound.

Germany Faces Steel Dilemma

Western Germany is wrestling with a dilemma in steel which is accentuated by the pound devaluation. Its costs are rising, but competitive prices were falling even before the devaluation. Industry is now reconsidering its proposal to the Allies to permit steel bar prices to be raised from $63.75 to $69.30 per metric ton and structural steel from $61.70 to $67.80.

The industry now pays $12.60 per metric ton of coke, in contrast to $11.40 formerly. Imported and domestic ore prices have also risen. Higher imported ore prices alone will increase steel's raw material costs by $32.4 million annually.

Ruhr steelmen are faced with competition in their own country now, so stiff is the battle for markets. They fear that French, Dutch and Belgian steel products, machinery and chemicals will eventually be dumped in Western Germany. Even the British, armed with their cheaper pound, may enter Ruhr markets.

German industry has just established a central group of all industrial trade associations. The new group will have its main offices in Frankfurt and Dusseldorf.

Indicative of the type of partner-

ship which may eventually be possible in the metalworking industry is a move by German and American pharmaceutical companies. Schenley Laboratories Inc., New York, and Farbenfabriken Bayer, Leverkusen, the largest chemical remnant of the former IG-Farben, have concluded a broad agreement on the exchange of know-how patents and licenses in the field of medicals. Bayer will soon produce penicillin and streptomycin under Schenley license, while Schenley will begin production of Bayer's antidotes for tuberculosis. This contract is the first such agreement since the end of the war.

Canada Devalues

Canada is going back to its wartime exchange rate on U.S. dollars. As from 1939 to 1946, Canadians will pay 110 Canadian cents for one U.S. dollar. An American dollar will bring $1.10½ Canadian.

The 10 per cent devaluation, as contrasted to Britain's 30 per cent markdown, is all that is deemed necessary. The effect on the Canadian economy is expected to be slight. There will be no change in the price newspapers pay for Canadian newsprint, the nation's biggest export to the U.S.

Yen-Pound Rate Adjusted

The Japanese are revising their yen-British pound rate, but the Jap currency is not being devalued.

"There is no intention to make any change at present in the existing yen-U.S. dollar rate," Allied headquarters says. This rate is 360 yen to one dollar. Under the new yen-pound rate, one pound will be worth 1008 yen compared to 1450.8 before devaluation. The adjustment comes amid a rising Japanese clamor for devaluation of the yen. The Japanese think that it will have rough going in world markets against the devaluated currencies of Britain and other countries.

Europe Trades "Know-How"

ANOTHER co-operative activity to revive western Europe's economy is an arrangement to exchange scientific and technological information. Organized by 15 nations under the OEEC (Organization for European Economic Cooperation), the agency for carrying out this program is the "Working Party on the Interchange of Technology." Its president is Dr. Alexander King of Great Britain and its vice president M. Edy Velander of Sweden.

First meeting brought agreement for the interchange not only of printed and written material, but also for the interchange of experts. Also approved was a resolution under which the countries will co-operate on research and development projects beyond the ability of a single country to undertake and execute. It was further agreed that such research projects would be located in the countries best fitted by natural circumstances and skills to carry out the work. Examples of fields in which such a course should be followed include underground gasification of coal, underground gasification of peat, and research on the Fischer-Tropsch process for the manufacture of oil and gasoline from coal. The next meeting of the Working Party, in November, will be devoted to outlining other co-operative research projects, and the development of plans for putting them in motion. At this meeting, also, the problem of measuring productivity—a subject of intense interest in all the OEEC countries because of their desire to reduce their production costs—will be discussed extensively.

Steel Rate's Destiny

Now that auto output is catching up with demand is subject for increasing conjecture

HOW FAR will the steel industry's operating rate drop if automobile production skids from its record-breaking levels?

This is a frequent question now that the auto industry, the nation's biggest consumer of steel, is rapidly catching up on demand for cars. Stocks of new autos in dealers' hands and in transit now average 16 per dealer, compared with 11 in mid-August and 25 before the war.

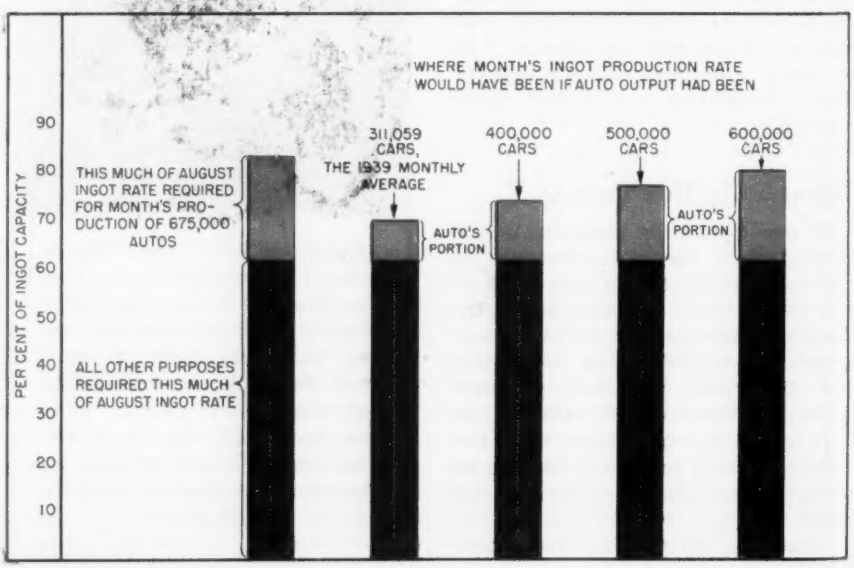
Calculations by STEEL indicate the alltime monthly record production of approximately 675,000 autos in August accounted for around 25 per cent or 1,741,500 tons of the nation's steel ingot output of 6,710,820 tons that month when steel production was at 82.2 per cent of capacity. The 4,969,320 tons remaining after excluding the auto industry's share of 1,741,500 tons is equivalent to a monthly production at 61 per cent of capacity.

In attempting to gage the impact an auto production cutback would have on steel operations it must be recognized that economic conditions responsible for such a reduction would likely also lower the steel needs of other consumers. How much their needs would decline can only be guessed. Such guessing is of questionable value and would tend to complicate mathematical projections.

To simplify visualization of the effects of lower auto production, STEEL has arbitrarily taken the portion of August's ingot rate accounted for by all steel consumption other than automotive and superimposed steel requirements of various levels of automobile production (see accompanying chart).

An auto production at the 1939 monthly average of 311,059 cars would have required only 802,532 tons of ingots and would have helped put the August ingot production rate at 70.5 per cent of capacity. Turnout of 400,000 cars a month would put the ingot rate at 73 per cent of capacity; a 500,000-car month would see the rate at 76 per cent; and in a 600,000-car month the rate would be 79.6 per cent.

What Drop in Auto Output Would Do To Steel Production



Outlook Brighter

Lighting fixture sales in next 12 months expected to show 24 per cent increase

AMERICANS will buy 24 per cent more lighting fixtures in the next 12 months than they have bought in an average postwar year.

This is the conclusion of the National Electrical Manufacturers Association, New York, on the basis of a survey made in Indianapolis by an independent market research agency.

Not Near Saturation—Even with this expected increase in buying, the market for lighting fixtures is not even approaching saturation, the association points out. Influencing the public to accept improved lighting standards is no easy task, it adds. Of the Indianapolis people who are not planning to purchase new fixtures soon, nearly 60 per cent say their lighting is entirely satisfactory. This phenomenon, the association declares, exists despite the low levels of illumination in this community, chosen for the survey because it was considered an average American city.

Most Lighting Inadequate—From the Indianapolis survey the association estimates that more than 85 per cent of the lighting in the average American city is inadequate. As a result of the survey a year's promotional program of relighting is to start Oct. 1 under direction of the Electric League of Indianapolis Inc. From the program NEMA hopes to learn not only the best means for promoting planned lighting but also the extent to which it can be sold in the average American city if all elements in the local electrical industry are working together under one direction.

Only Fifth Bought Since War—Less than 20 per cent of the lighting fixtures in use in Indianapolis have been installed since the end of World War II, the survey shows. Approximately three-fourths of the fixtures sold in the postwar period have been fluorescent, the rest incandescent.

In a group of areas where 50 footcandles of illumination are recommended, readings of 46 footcandles and better accounted for only 9 per cent of the total. In these same types of areas more than one-third were less than 10 footcandles, and considerably over one-half were less than 20 footcandles.

Board To Study Renegotiation

WHILE the Munitions Board is unwilling to say anything about the nature of the discussions to be held Oct. 12, when it holds its first meeting with the new Industry Advisory Committee on Military-Contractor Relationships, outside reports are that profit limitation and renegotiation of negotiated contracts will be high on the agenda. Businessmen may be asked to recommend a long-term policy covering both peacetime and wartime renegotiation under the terms of the Renegotiation Act of 1948 which gave the Secretary of Defense considerable latitude in using his judgment as to when and where renegotiation should be applied. Membership of the industry committee has not yet been announced.

An amendment to Part 423, Military Renegotiation Regulation, defines the grounds for exemption of military contracts or subcontracts by general classes or types from renegotiation. In general, exemptions "will be made only when the economic conditions in the industry concerned, the volume of business, or other conditions give reasonable assurance that excessive profits will not be realized from the contracts or sub-contracts," and "such an exemption will not be granted unless the jurisdiction applies to a substantial segment of the industry involved."

Gun Factory Marks 150th Year

OCT. 2 will mark the 150th anniversary of the United States Naval Gun Factory on the Anacostia river in Washington. On that date, in 1799, the Navy took possession of the site and started erection of the first buildings.

Known as the Washington Navy Yard, the plant built numerous warships, and served as the country's principal naval ship repair yard. It was burned during the war of 1812, rebuilt and later used to manufacture fleet equipment, eventually specializing on guns. It was the center for the design and development of experimental models for the new weapons introduced during World War II; the name Naval Gun Factory was adopted in 1945. Celebration of the event, featured by the showing of much Navy equipment in action, will start Sept. 26 and conclude Oct. 2.

Tool Men To Meet in Philadelphia

AMERICAN Society of Tool Engineers will hold an exposition showing the latest cost-cutting equipment and methods next April at Philadelphia's Convention Hall and Commercial Museum.

The show, to be held Apr. 10-14, will demonstrate the cost-cutting needs of all types and sizes of metalworking companies.

CALENDAR OF MEETINGS

Sept. 26-28, National Electronics Conference: 1949 conference and exhibit sponsored by Illinois Institute of Technology, Edgewater Beach Hotel, Chicago.

Sept. 26-28, American Mining Congress: Metal Mining Convention, Spokane, Wash. Congress headquarters are in the Ring Bldg., Washington.

Sept. 26-28, American Management Association: Personnel conference, Waldorf-Astoria Hotel, New York. Association headquarters are at 330 W. 42nd St., New York.

Sept. 27-30, American Society of Mechanical Engineers: Fall meeting, Hotel Lawrence, Erie, Pa. Society headquarters are at 29 W. 39th St., New York.

Sept. 29, American Iron & Steel Institute: Regional technical meeting, Hotel Statler, Buffalo.

Oct 3-4, National Association of Corrosion Engineers: South central regional meeting, Adolphus Hotel, Dallas. Heading the arrangement committee is G. R. Olson, United Gas Pipe Line Co., Shreveport, La.

Oct. 3-5, American Coke & Coal Chemicals Institute: Annual meeting, Skytop Lodge, Skytop, Pa. Institute headquarters are at 129 15th St. N.W., Washington.

Oct. 3-6, Association of Iron & Steel Engineers: Annual convention, William Penn Hotel, Pittsburgh. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Oct. 4-6, Society of Industrial Packaging & Materials Handling Engineers: Fourth annual exposition, Detroit.

Oct. 6, American Iron & Steel Institute: Regional technical meeting, Drake Hotel, Chicago.

Oct. 10-11, Boston Conference on Distribution: 21st annual affair, sponsored by Boston Chamber of Commerce, Harvard University, Boston University and others.

Oct. 10-13, Purchasing Agents Association of Baltimore: Annual manufacturers' products exhibits, Lord Baltimore Hotel, Baltimore. Chairman of the management committee is Stephen J. Buschman, Stark Electric Co., 1300 S. Short St., Baltimore.

Oct. 10-14, American Society for Testing Materials: First Pacific area national meeting, Fairmont Hotel, San Francisco. National headquarters are at 1916 Race St., Philadelphia.

Oct. 11-14, American Standards Association: 31st annual meeting, Waldorf-Astoria Hotel, New York. Association headquarters are at 70 E. 45th St., New York.

Oct. 12-15, Electrochemical Society: 96th convention, La Salle Hotel, Chicago. Details may be obtained from H. B. Linford, secretary, 235 W. 102nd St., New York.

Oct. 13, American Iron & Steel Institute: Regional technical meeting, Hotel Pick-Ohio, Youngstown.

Oct. 13-14, Steel Founders' Society of America: Fall meeting, Ambassador Hotel, Los Angeles, Society headquarters are in the Midland Bldg., Cleveland.

Oct. 13-14, Society for the Advancement of Management, Chicago Chapter: Fall training conference, at Illinois Institute of Technology. Conference chairman is H. A. Mercer, Sterling Tool Products Co., 2085 N. Hawthorne Ave., Melrose Park, Ill. Fee is $15 for society members and $30 for nonmembers.

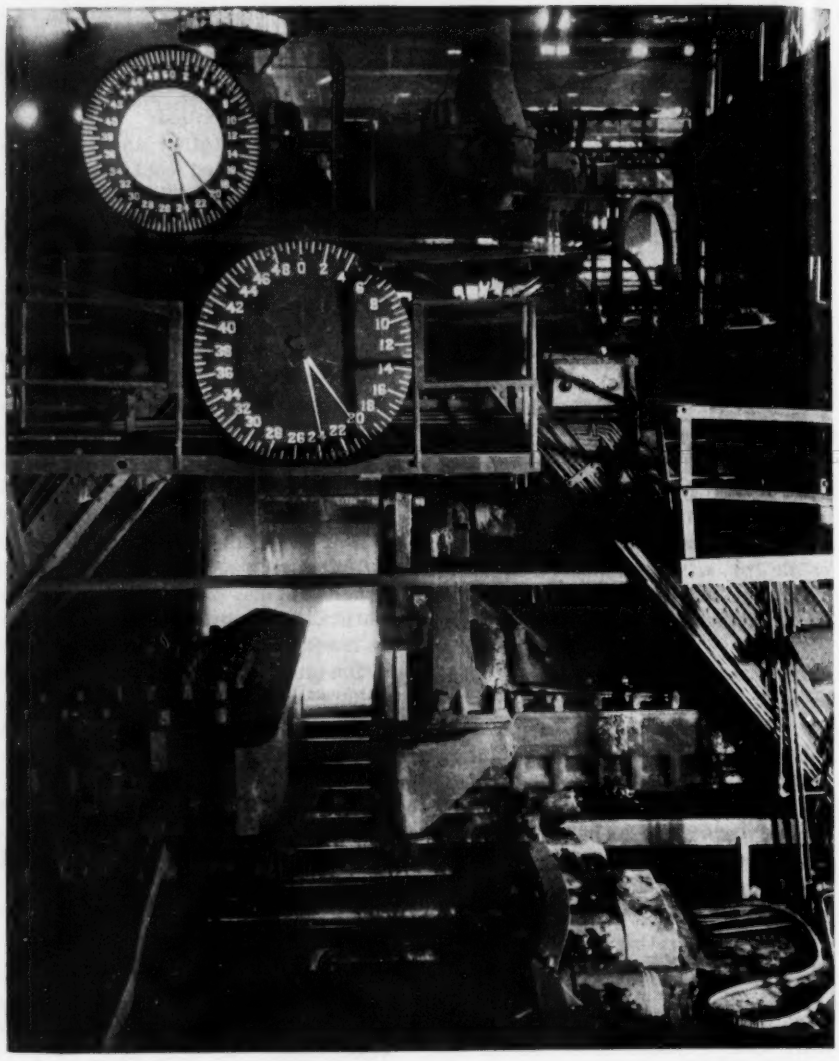
Oct. 13-15, Industrial Management Conference of the University of Missouri: Third annual meeting, University of Missouri, Columbia, Mo.

Oct. 13-15, Foundry Equipment Manufacturers Association: Annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Association headquarters are in the Engineers Bldg., Cleveland.

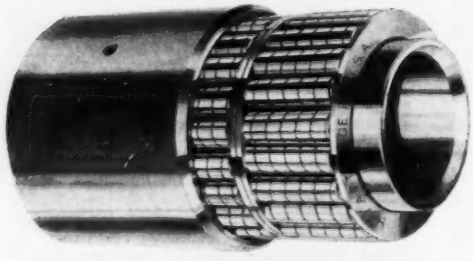
Oct. 14-16, Metal Treating Institute: Annual meeting, Cleveland. Institute headquarters are at 420 Lexington Ave., New York.

Oct. 17-20, Wire Association: Annual convention, LaSalle Hotel, Chicago. Association headquarters are at 300 Main St., Stamford, Conn.

At ALIQUIPPA Too!



THE straight cylindrical construction of the bearings allows for roll expansion due to temperature changes without cramping the bearing. Hyatt Roller Bearings have demonstrated their ability to operate continuously without excessive wear. Since there is little wear on the bearings, gear centers are accurately maintained. Easier turning gears with a minimum of gear replacement are the result.



HEAVY DUTY Hyatt Roller Bearings on the table rolls and line shafts of the 44″ Blooming Mill at the Jones & Laughlin Steel Corporation Aliquippa Works offer the kind of operating and maintenance advantages that Steel Mill operators appreciate.

Hyatt Bearings are engineered to take the heavy impacts and excessive heat incidental to normal steel mill table operation. The Bearings are designed into simple housings thus facilitating maintenance. They offer positive lubrication and great resistance to shock load.

On blooming mills as in so many other steel mill applications Hyatt Bearings can be a real time, labor and money saver. Why not let us show you what we can do for you. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.

HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

New Nash models bring few appearance changes. Ambassador engine compression ratio stepped up and cylinder head designed for revised combustion chamber shape

DETROIT

FIRST shown publicly last Friday, the 1950 Nash models have been in production since Labor Day, permitting distribution of around 5000 to dealers for display. Meanwhile, assemblies at Wisconsin and California plants are heading for 700 per day, well ahead of the rate prevailing in August, when the 1949 models were concluded. Record-breaking sales last month indicate that dealers had few, if any, of the older models to clear out before unveiling the new job.

From an appearance standpoint, changes are few, being confined principally to a 10-inch increase in the width of the rear window, resulting in a 33 per cent expansion of glass area therein. Also, wider entry is provided through front and rear doors, in line with the trend apparent throughout the industry.

Small Series Renamed—The former 600 series has been renamed the Statesman, the larger series continuing to be the Ambassador. Wheelbase, overall length, height, width, tread and other basic dimensions are unchanged from the preceding models. Of particular interest is the introduction of hydra-matic drive on the Ambassador, this making the second producer outside General Motors to offer this automatic driving feature, the other of course being Lincoln.

Engine for the Ambassador has been stepped up in compression ratio from 7 to 7.3:1. A new cylinder head has been designed to accommodate the revised combustion chamber shape. In it, valves are inclined from the vertical by 11 degrees and simplifications made in the overhead valve lubricating system.

Felt wicks, previously used for lubrication of contact areas between rocker arms and valve stems were found to be erratic in their action and difficult to control in production as to position, fit and metering characteristics of the felt. Instead, oil is now fed under pressure to the hollow rocker arm shaft and is distributed directly to each rocker arm bearing.

For lubrication of the two ends of each rocker arm, a metering hole is provided in the top at the shaft bearing. The arm forging is shaped to prevent excess oil running down the arm to the valve stem, and in addition a baffle inside the cover shields the valve area. Rubber seals on the valve stems at the spring retainer further guard against seepage of oil down the stems into the guides.

Automatic Transmission—Adoption of the hydra-matic transmission has called for changes in the crankshaft and flywheel. Normally, the starter gear is formed by a separate steel ring shrunk onto a relatively heavy cast iron flywheel. In the new design the flywheel, comprising part of the housing for the fluid coupling, is a stamped steel plate with ring gear teeth cut directly into the edge.

Balancing, once accomplished by drilling metal from the heavy side of the cast flywheel, now is done by balancing the crankshaft itself, drilling metal from the cheeks if necessary. Later, the shaft and flywheel are assembled and the entire unit rebalanced if needed. The shaft has solid crankpins and heavier counterweights to maintain running dynamic balance. In earlier models the crankpins were drilled lengthwise to reduce rotating weight of the throws. These lightening holes required inserted pipe to conduct oil from the main bearings to the connecting rods. The solid pin design is more rigid, easier to manufacture and less likely to develop oil leaks at the inserted tubes.

Starter on Transmission Lever—Incidentally, the starter control on models equipped with automatic transmission is actuated by merely lifting the transmission control lever a short distance. The system, developed by Nash engineers, is considered faster and more convenient than the conventional dash-mounted pushbuttons.

A few other changes were made to accommodate the hydra-matic. Throttle linkage has been extended to connect the carburetor and transmission so that the necessary torque sensitivity will be provided to vary shift speeds, depending upon accelerator pedal position and engine torque output. Body floor has been altered in shape to provide necessary clearance over the transmission. Fast idle cam on the carburetor is revised for more accurate control of idle speed during engine warmup and to reduce creeping tendencies of the transmission. Forward end of the propeller shaft now is of a tubular section to increase stiffness and reduce a tendency toward noise noted at low

FIRST GERMAN AUTO SHOW: This Hansa 1500, styled along American lines by the Carl Borgward factory in Bremen, was one of the vehicles shown at Germany's first auto exhibit since the beginning of World War II, held this month in the British sector of Berlin. The Hansa, one of 80 different cars and motorcycles displayed at the fair, has a maximum speed of about 75 miles an hour and can get 27 miles to a gallon of gasoline. NEA photo

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speeds with certain throttle positions.

Reclining Seats — Novel interior change has made the glove box of the sliding bin type located at the center of the instrument panel below the radio controls. A reclining type of front seat back is another interesting option. In addition to the normal bed position, the seat beside the driver may be adjusted to three intermediate reclining positions.

High-Frequency Lamination

USE of a new technique of radio high-frequency heating at the Iron Mountain, Mich., plant of Ford has reduced the fabrication of frames and pillars for wood station wagon bodies to a matter of minutes and at the same time improved quality. Under the former system of lamination, it was necessary to apply heat to the outside and wait for long periods of time for the heat to flow into the wood. With radio frequency equipment, heat is introduced into the body framing member within minutes.

A companion development has been the introduction of superior glues of the resin type. They are highly resistant to heat and moisture and develop a strength greater than wood itself. The division has installed 18 new 75-ton laminating presses to handle the work.

In the process, the package of resin-coated wood plys to be bonded is placed in a press between two copper electrodes, connected to the high-frequency generator. Voltages of 3000-4000 are applied across the electrodes while the wood laminates are held together under pressure of 300 psi. The laminated pillars electronically bonded with phenolic resin while under pressure not only save wood as compared with the solid stock type of construction, but in addition are far stronger.

New Delivery Chassis

A NEW heavy-duty Ford parcel delivery chassis now is being supplied on special order to meet what is described as growing demand for vehicles with 350-450 cu ft of body capacity in multi-stop delivery service. The forward-control type chassis on 134-inch wheelbase is produced with grille, windshield and front quarter windows, easy-access engine cover and tilting driver's seat. Bodies are not supplied by Ford but there are a number of manufacturers of these units in various sections of the country. The chassis will accommodate 10½ to 12½-foot delivery bodies, and supplements shorter-wheelbase designs introduced eight months ago. Ford truck sales, by the way, were the highest since July, 1948, contrasting with the general declines noted in the overall truck market.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,996
June	623,689	454,401
Six mos.	3,134,055	2,617,581
July	604,351	489,736
August	675,000*	478,186
September		437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

* Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
Sept. 3	146,039	101,879
Sept. 10	123,806	78,677
Sept. 17	154,330	94,410
Sept. 24	156,000	98,394

Estimates by Ward's Automotive Reports

Automakers Watch for Strikes

AS THE outlook for coal and steel grew dimmer, the motor industry was showing increasing concern over the possibility of maintaining its high rate of production through the fall months. Steel stocks generally are above normal, although some items are considered in the critical stage and their lack might shut down production, even though there remained a sufficient supply of most requirements. Chrysler plants, for example, according to a corporation spokesman, have on hand enough steel for 6-8 weeks of operation at present levels, in contrast with a normal 3-4 weeks. Other producers are about in the same situation.

Coal stocks also are comfortable in the Detroit area, and it would be 6-8 weeks before they could be depleted. The Detroit Edison Co., one of the largest coal consumers here, reported it has better than four months' supply for normal operations.

Revise Selling Agreements

GENERAL MOTORS has announced it is revising its forthcoming selling agreements with distributors and dealers handling its divisional products "in the light of legal trends under the Anti-trust Laws." The corporation declared that the 5 to 4 opinion of the Supreme Court in the Standard Oil Co. of California case "emphasizes the uncertainty of the law and the difficulty of determining the legal status of contract clauses which have heretofore been considered legal and proper as well as desirable to the public dealers."

Reduced to every-day language, what appears to be involved is the question of "territorial protection" for dealers. This clause in contracts provides that a dealer who sells a new car or truck outside of his territory must pay a cash penalty to the dealer in whose area such a sale was made. This penalty clause has been in effect for many years, although it was not enforced since 1942 because of the war. It is understood to have been resumed a few months ago. Current revisions are not being dictated by any applicable court decision, being merely anticipatory in character.

"Complete Phony"

FRANK RISING, head of the Automatic Parts & Equipment Manufacturers Inc., who can turn a neat phrase with the best of them, has some plain-spoken words to offer on the steel industry fact-finding-board's report, to wit: "It's a pretty thing—that gold brick which the steel-industry board polished up and handed to the steel union. Boy, what a bargain. A hundred-dollar pension for six cents."

"Of course it is a complete phony, and Phil Murray ought to can the advisers who told him to grab it. At six cents for 2000 hours a year, it would take about 80 years to build up enough annuity stake to cover the difference between federal dole and the glittering hundred bucks.

"The stupidity of the report is not the worst feature, however. Nor is its infatuation for the universal dole. What is worse is the fact there was a report at all, and that it got such wide approval in so many quarters. Here were three men, surrounded as they said in statement by a 'welter of controverted fact and theory,' yet bringing out a unanimous batch of guesses which is to be accepted by everyone as the new way of life.

"What is it that has got into us all, to cause such satisfaction and agreement with this mass of double-talk? What kind of people are American union leaders and business executives to take with good humor this fatuous, meddlesome bungling? Both sides, if they had a proper amount of self-respect, should denounce the whole deal."

CONSOLIDATING ALL YOUR FASTENER PURCHASES WITH A SINGLE SOURCE OF SUPPLY . . . helps get *True Fastener Economy*. RB&W, manufacturing *all* the most popular types of fasteners, offers you prompt delivery on whatever style and size of **PLOW, STEP** and **ELEVATOR BOLT** you specify . . . and also the dependable performance that results from more than a century of continuous research and progressive development in fastener manufacturing.

R B & W

THE COMPLETE QUALITY LINE

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

104 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

Ceco Builds in Birmingham

New district plant and warehouse another phase in metal products firm's expansion

CECO Steel Products Corp. is building in Birmingham an 88,000 sq ft plant and warehouse. This marks another step in the firm's expansion program which involves 15 plants from coast to coast. The company's district manufacturing and warehousing operations will be transferred to the new location from suburban Bessemer, Ala.

About 200 men will be employed in the new plant which will manufacture open-web steel joists and fabricate reinforcing steel for buildings and highways. The facility will also be used for warehousing metal windows and doors, metal frame screens, metal lath and accessories, steel roof deck and steelforms for reinforced concrete joist construction.

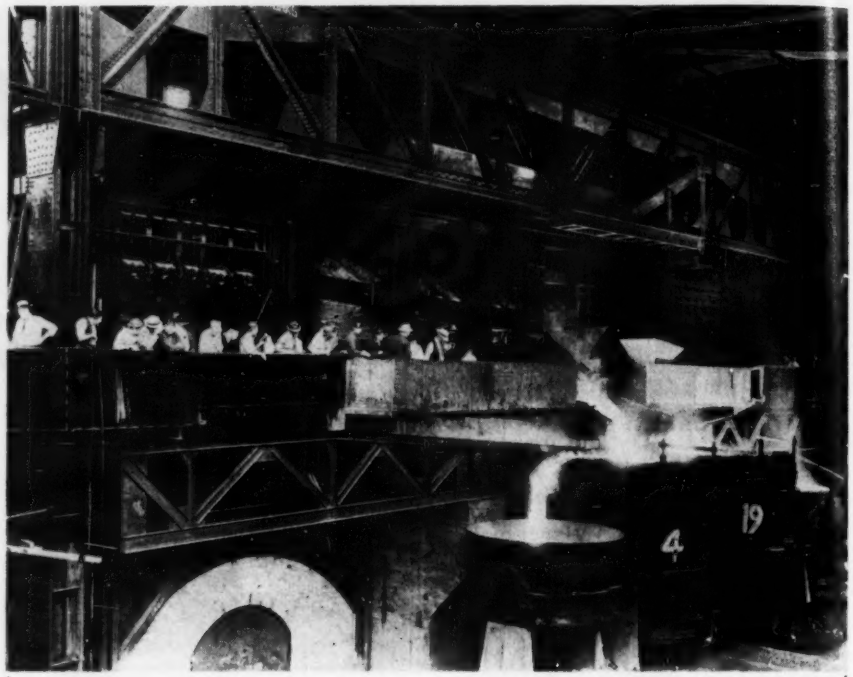
Ceco which now maintains its general ofices in Chicago was organized in 1912 in Omaha, Nebr., as Concrete Engineering Co. Its initial efforts were devoted largely to the introduction of a new system of concrete joist floor construction, invented and patented by C. Louis Meyer, the firm's founder.

With the widespread acceptance of this method of construction the company has grown until it now has plants located coast to coast. Since the early years of its formation, Ceco has developed and widely diversified its services and products so that they are used in thousands of structures ranging from homes to large buildings.

Laboratory Site Purchased

PURCHASE of the Easttown School building in Berwyn, Pa., and plans for its conversion into a scientific research and development laboratory are announced by Foote Mineral Co., Philadelphia. Located between the company's main office and its plant at Exton, Pa., the laboratory will provide easy access to management, sales and promotion.

Development of new and improved products and enhancement of quality and markets for present products in the fields of chemicals, metals and alloys, welding rod coatings, ceramic glazes, enamels and bodies as well as engineering studies related to improvement in equipment design and process control will be carried on in the new location. In addition to projects in these fields, a number of projects will be carried out under contract with government agencies and several co-operative projects with outside companies will be included.



GIANT OPEN HEARTH: Molten steel pours into ladles from Weirton Steel Co.'s new 550-ton open hearth at Weirton, W. Va. The furnace is more than three times the size of the average unit; raw steel from a single heat is equal in weight to the total amount in more than 400 automobiles

Outside Work Being Taken

FACILITIES for the manufacture of a wide range of products are being made available at the Imperial Works, Oil City, Pa., plant of Oil Well Supply Co. New business for the U. S. Steel Corp. subsidiary will be handled by a specialty sales department, supplementing its sales organization which serves the oil industry.

Wartime addition of many products and postwar improvements have added to the plant's flexibility. These factors make it possible for the company to take orders for diversified commercial products without affecting manufacture of oil well supplies.

Machine shop, iron and steel foundry, forge and heat treating departments have all been modernized.

A. O. Smith Sells Heating Device

NEW A. O. Smith product marketed after a field-testing program is an inexpensive heat controlling device for gas burning heaters.

Designed to provide a constant flow of heat instead of the on-and-off heating in many conventional heaters burning gas or oil, the unit regulates the amount of fuel being injected into the heater. This is done by action of a capillary tube which expands when the air is heated and compresses a bellows to throttle down a valve regulating fuel injection.

Units are being manufactured at Smith's Kankakee, Ill., plant. They are sold as optional equipment with the firm's new conversion burner made to utilize older furnace models for burning gas.

More Titanium Available

PURE TITANIUM in relatively large amounts is being produced at the Watervliet, N. Y., plant of Allegheny Ludlum Steel Corp. Experimental lots of the metal are available in strip, bar and wire form, at a price range of $5 to $20 a pound. Lower prices are believed likely through further development of technique.

AEC, Blaw-Knox Negotiate

ATOMIC ENERGY Commission is negotiating with the Chemical Plants Division of Blaw-Knox Construction Co., Pittsburgh, for a contract covering architect-engineer services for engineering design of a materials testing reactor.

Primary purpose of the new reactor will be to test various reactor construction materials under intense neutron bombardment greater than any experienced before.

Briefs . . . .

Paragraphs on developments of interest and significance within the metalworking industry

Manganeso Reduction Corp., Baltimore, has been organized to produce magnesium chloride. Its president is Carroll S. Hardester. Location of a 7500-sq ft plant to be erected soon has not yet been decided. Officials of the new company are also officials of Chlorinated Products Co., Baltimore.

—o—

Hauser Machine Tool Corp., Manhasset, N. Y., was appointed exclusive U. S. factory representative for Schaublin Ltd., Bevilard, Switzerland. Among precision tools Hauser will make available to American manufacturers are Schaublin turret, repetition and lead-screw lathes, milling and multiple drilling machines, and accessories.

—o—

Research Engineering & Mfg. Co., has been formed in New Bedford, Mass. Firm's activities will include patent investigations to determine feasibility of manufacture, outright purchase of valid patents and manufacture of patented articles on a royalty basis. P. Sweeney is its president.

—o—

McNamara Co. Inc., Baltimore, manfacturer of steel tanks, smoke stacks, hoppers, bins and similar products, is completing its 25,000-sq ft factory building and plans to move to the new location about Oct. 15.

—o—

Lodge & Shipley Co., Cincinnati, has discontinued manufacture of the Acme line of turret lathes to devote more of its facilities to the continual development of its extended line of new model "X" and Duomatic lathes. Company will continue to furnish repair parts and most turret lathe tooling for Acme turret lathes built by the former Acme Machine Tool Co. and by Lodge & Shipley.

—o—

United Steel of America Inc., Baltimore, expanded its facilities for manufacturing steel roof joists.

—o—

Bay State Abrasive Products Co., Westboro, Mass., announces its Detroit branch office and warehouse is now located at 880 Lawndale Ave. The new location offers increased stocks plus a completely modernized grinding wheel alteration service for the company's customers in the Michigan area.

—o—

Victor Equipment Co., San Francisco, is now manufacturing corrosion resistant regulators for the precision control of any gas, wet or dry. Regulators can handle chlorine, sulphur dioxide, hydrogen sulphide, ammonia and boron trifluoride in wet form at delivery pressures up to 5000 psi and gas volumes up to 2000 cfm.

—o—

Century Engineers Inc. has been formed in Burbank, Calif., to offer service in fields of aircraft design, transportation equipment, radio, optical and astro-physics instruments and electrical equipment.

—o—

General Electric Co.'s chemical department announces formation of a Laminated and Insulated Products Division with headquarters in Coshocton, O., and with responsibility for laminated and fabricated plastics products manufactured in Coshocton and for insulating materials produced in Schenectady, N. Y.

—o—

United States Testing Co. Inc., Hoboken, N. J., expanded its services in the control of welding operations to include qualification of welders for welding contractors and steel fabricators. Work is being carried on in the company's plant at Hoboken. Service permits employers to send prospective welder employees to the plant for qualification and weldment tests.

—o—

Gast Mfg. Corp., Benton Harbor, Mich., appointed Process Industries Engineers Inc., Pittsburgh, representative for Gast's rotary air motors, compressors and vacuum pumps. Territory for Process is western Pennsylvania, eastern Ohio and West Virginia.

—o—

McNally Pittsburg Mfg. Corp., Pittsburg, Kans., has added two engineering service officers, one in Terre Haute, Ind., and another in Charleston, W. Va. Addition of Jerome V. Lentz in Terre Haute and Irving M. Craig in Charleston brings McNally Pittsburg's total of engineers in coal preparation activities to 136.

—o—

Research Corp., New York, announces that Niagara Blower Co., New York, has been awarded the license to manufacture dehumidifying and air conditioning equipment under its series of patents covering removal of moisture from air or other gases by use of a hydroscopic liquid. Method developed by Research Corp.'s scientists is to dehumidify air by contact with a liquid spray which absorbs moisture from the air stream passing through the equipment. One application of the process is prevention of moisture damage to metal and electric products.

—o—

United Metal Products Division of Diebold Inc., Canton, O., appointed Demsey & Associates to represent the protective device company in the Ohio, Pennsylvania and New York areas. Demsey & Associates is establishing dealer outlets throughout those states.

—o—

Fentron Steel Works Inc., Seattle, metal window and door manufacturer, opened a San Francisco sales office. R. M. DesCamp, formerly chief estimator of the company, will promote sales and service.

—o—

Aerol Co. Inc., Los Angeles, opened a Cleveland warehouse. Company supplies industrial wheels, casters and hand trucks and other types of materials handling equipment.

—o—

Parker Appliance Co., Cleveland, appointed Metal Goods Corp., Dallas, distributor of Parker O-rings for static and dynamic seals for hydraulic and other fluid-handling systems.

—o—

Western Electric Co., forwarded a letter to all company stockholders advising them of special meeting Sept. 27. A proposal will be submitted to increase the company's authorized capital stock from 9 million to 10.5 million shares. Proceeds from the proposed issue, to be issued pro rata to stockholders would be used largely for repayment of outstanding indebtedness.

—o—

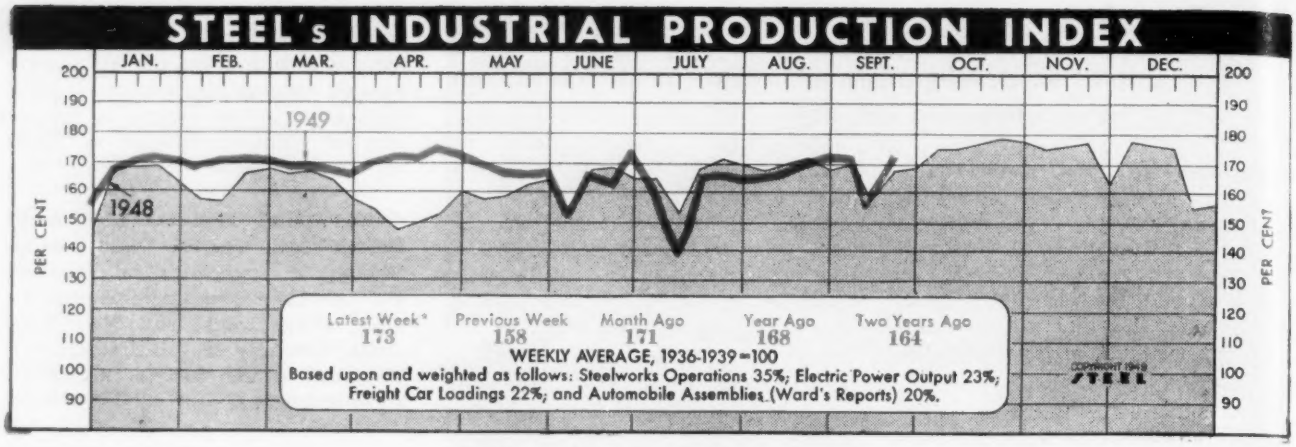
Rotor Tool Co., Cleveland, appointed Russell & Olson Co., Detroit, exclusive agents for Rotor's complete line of electric and pneumatic drills, nut setters, screw drivers, buffers, polishers, grinders, scalers, rammers and chippers in the the Detroit-Toledo and Michigan areas.

—o—

John Nooter Boiler Works Co., St. Louis, is changing its name Oct. 1 to Nooter Corp., since the company's activities in manufacture of tanks and pressure vessels make the old name obsolete.

—o—

Society of Industrial Packaging & Materials Handling Engineers will conduct its Second Wayne University Packaging & Materials Handling Institute under the auspices of the Wayne University School of Business Administration Oct. 3 through 7 in Detroit.


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
PER CENT
1949
1948
Latest Week* 173
Previous Week 158
Month Ago 171
Year Ago 168
Two Years Ago 164
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
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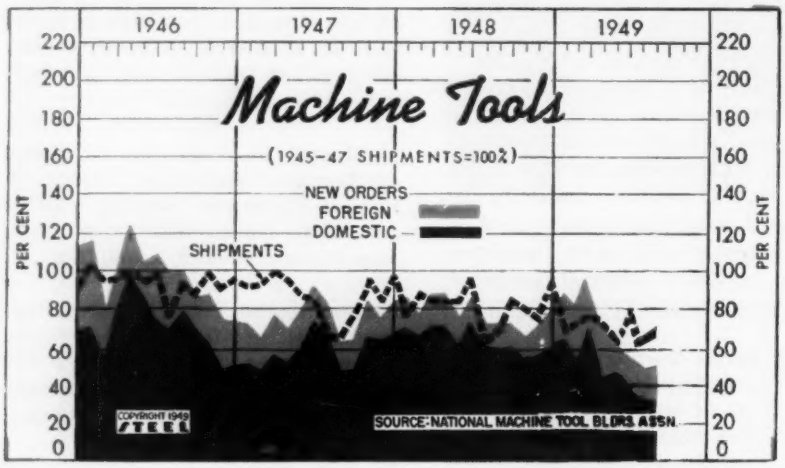
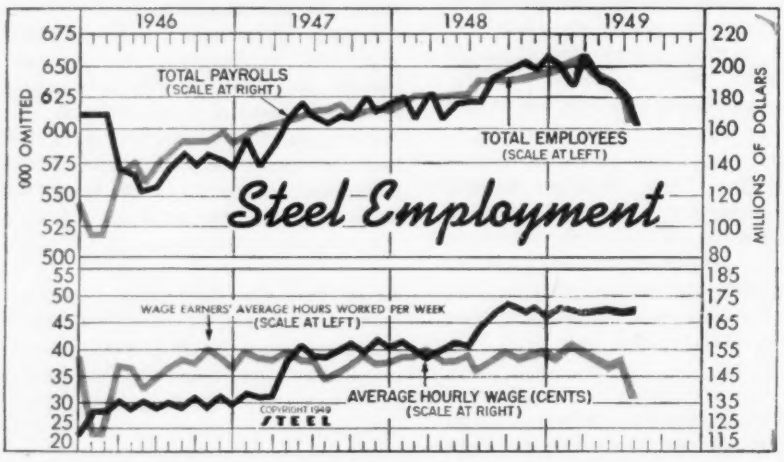
* Week ended Sept. 17 (preliminary).



Machine Tools

(1945-1947 Shipments = 100)

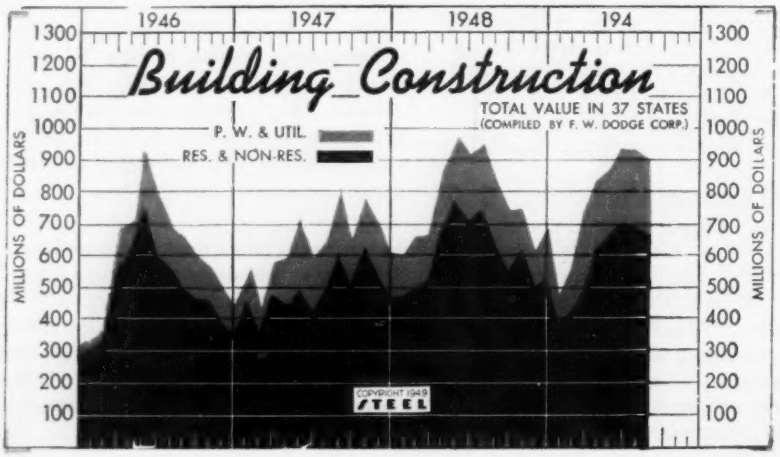
	Orders				Shipments	
	Total		Domestic			
	1949	1948	1949	1948	1949	1948
Jan.	87.0	83.1	65.1	69.1	68.8	75.3
Feb.	80.9	77.3	54.4	64.6	70.3	87.1
Mar.	93.5	86.3	71.2	70.2	75.8	83.6
Apr.	70.1	86.3	47.0	72.2	74.7	82.0
May	63.7	73.5	47.9	62.1	72.8	82.6
June	53.6	83.4	38.0	71.5	79.0	94.4
July	48.0	74.0	34.0	61.1	60.7	62.4
Aug.	51.4	73.7	18.7	60.9	68.0	69.8
Sept.	...	73.1	...	61.5	...	84.7
Oct.	...	67.4	...	53.4	...	80.4
Nov.	...	72.2	...	54.1	...	76.2
Dec.	...	76.7	...	60.5	...	96.9


1946 1947 1948 1949
Steel Employment
TOTAL PAYROLLS (SCALE AT RIGHT)
TOTAL EMPLOYEES (SCALE AT LEFT)
WAGE EARNERS' AVERAGE HOURS WORKED PER WEEK (SCALE AT LEFT)
AVERAGE HOURLY WAGE (CENTS) (SCALE AT RIGHT)
000 OMITTED
MILLIONS OF DOLLARS
COPYRIGHT 1949 STEEL

Steel Employment

	Employees† (000)		Total Payrolls (millions)		Hourly Wages† (cents)	
	1949	1948	1949	1948	1949	1948
Jan.	650	622	$202.1	$180.2	171.3	157.3
Feb.	653	626	189.8	167.6	169.6	155.3
Mar.	652	629	207.2	183.0	168.5	154.8
Apr.	647	626	191.9	168.5	168.8	155.1
May	637	628	188.4	175.3	169.7	157.7
June	625	634	181.8	179.5	168.4	156.9
July	610	641	160.3	179.8	169.9	164.5
Aug.	...	645	....	193.8	....	168.9
Sept.	...	641	....	199.4	....	171.8
Oct.	...	644	....	201.7	....	169.9
Nov.	...	646	....	199.8	....	172.1
Dec.	...	648	....	205.8	....	169.4

† Monthly average.


1946 1947 1948 194
Building Construction
TOTAL VALUE IN 37 STATES (COMPILED BY F. W. DODGE CORP.)
P. W. & UTIL.
RES. & NON-RES.
MILLIONS OF DOLLARS
COPYRIGHT 1949 STEEL

Construction Valuation in 37 States

(Unit—$1,000,000)

	Total	Public Works, Utilities		Residential and Non-residential	
	1949	1949	1948	1949	1948
Jan.	483.0	102.0	136.6	381.0	478.6
Feb.	568.5	153.5	177.3	415.0	504.6
Mar.	747.6	168.4	164.3	579.2	525.5
Apr.	842.6	222.4	184.7	620.2	689.2
May	880.3	213.5	205.0	666.9	765.8
June	945.7	239.0	215.7	706.7	719.5
July	943.6	252.7	217.9	690.9	744.8
Aug.	905.7	234.3	207.8	671.5	646.3
Sept.	....	....	202.7	....	559.5
Oct.	....	....	165.5	....	613.1
Nov.	....	....	106.9	....	504.3
Dec.	....	....	170.9	....	523.1
Total	....	....	2,155.3	....	7,274.4

The Business Trend

INDUSTRIAL activity made a sharp ascent in the week ended Sept. 17 as STEEL's industrial production index reached a preliminary 173 per cent of the 1936—1939 average, a 15-point rise over the preceding week. In the corresponding week of 1948 the index was 168 after a ten-point gain over the preceding week.

AUTOMOBILES—An increase of more than 20,000 passenger car and truck assemblies in the week ended Sept. 17 from the preceding week's total was a major factor in the rise of STEEL's index. The industry assembled 154,330 units in the latest week, compared with 123,806 a week earlier and 94,410 in the same week a year ago. Outturn is expected to remain high for the rest of this month but schedules may be trimmed in subsequent months because of a "normal" seasonal sales decline. Model changes are being readied by most builders in preparation for increased sales competition in 1950. Chrysler is reportedly striving for a November changeover; some of the independents already have new models in production.

STEEL—The ingot rate also advanced in the week ended Sept. 17 to 86.5 per cent of capacity, highest point since the week ended June 18. A decline in the steelmaking rate is expected during the current week, largely because of labor unrest. Some blast furnaces are being banked to save fuel as result of the coal strike and others are being banked as a precaution against a steel strike.

COAL—Bituminous coal output fell to 5,820,000 net tons in the week ended Sept. 10. Miners worked only two days that week as the abbreviated work-week was trimmed still further by the holiday.

TRUCKLOADINGS—American Trucking Associations Inc. reports the volume of freight transported by motor carriers in July dropped 8.4 per cent below June and 1.3 per cent below July, 1948. These carriers transported an aggregate of 2,859,681 tons in July, compared with 3,121,144 tons in June and 2,897,985 tons in July a year ago. Carriers of iron and steel hauled about 4 per cent of the total tonnage. Their traffic volume decreased 20.9 per cent below June but was up 5.2 per cent over July, 1948.

CONSTRUCTION—Civil engineering construction volume totaled about $156 million in the week ended Sept. 15, an increase of 6 per cent over the preceding week but a decline of 15 per cent from the corresponding week last year. Heavy construction for the year to date totals about $5.8 billion, 18 per cent above the corresponding total a year ago. Private construction for the period totals $2.7 billion and public construction $3.1 billion. Both categories represent gains over 1948 totals for the same period but the public construction gain of 21 per cent tops the 15 per cent gain in private building.

PRICES—The wholesale price index of the Bureau of Labor Statistics advanced 1.2 per cent in the week ended Sept. 13 to 154.6 per cent of the 1926 average. At this point it is 1.8 per cent above four weeks ago and 9 per cent below the comparable week in 1948.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	86.5	85.0	83.5	96.0
	Electric Power Distributed (million kilowatt hours)	5,579	5,258	5,578	5,426
	Bituminous Coal Production (daily av.—1000 tons)	970	1,342	1,333	1,863
	Petroleum Production (daily av.—1000 bbl)	4,845	4,851	4,723	5,597
	Construction Volume (ENR—Unit $1,000,000)	$156.0	$146.5	$137.2	$183.3
	Automobile and Truck Output (Ward's—number units)	154,330	123,806	149,359	94,410
	*Dates on request. †1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.				
TRADE	Freight Carloadings (unit—1000 cars)	705†	624	731	910
	Business Failures (Dun & Bradstreet, number)	185	148	193	84
	Money in Circulation (in millions of dollars)‡	$27,454	$27,589	$27,383	$28,156
	Department Store Sales (changes from like wk. a yr. ago)†	—4%	—5%	—15%	—2%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$12,827	$10,492	$12,640	$13,454
	Federal Gross Debt (billions)	$256.5	$256.4	$254.9	$252.1
	Bond Volume, NYSE (millions)	$14.3	$9.7	$16.1	$13.8
	Stocks Sales, NYSE (thousands of shares)	6,812	3,201	5,020	3,352
	Loans and Investments (billions)†	$65.7	$65.8	$64.2	$63.3
	United States Gov't. Obligations Held (millions)†	$37,378	$37,307	$36,144	$34,652
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	152.52	152.52	152.52	151.86
	STEEL's Nonferrous Metal Composite‡	180.3	180.3	180.1	220.7
	All Commodities†	154.6	152.7	151.9	169.9
	Metals and Metal Products†	168.9	168.9	167.9	172.0
	†Bureau of Labor Statistics Index. 1926=100. ‡1936-1939=100. ††1935-1939=100.				

Men of Industry

CHARLES A. BUTCHER

LLOYD WOLF

GRIFFITH C. TAAFFE

Charles A. Butcher has been elected a vice president of Elliott Co., Jeannette, Pa. He will continue as general manager of the Crocker-Wheeler Electric Mfg. Co., Ampere, N. J., a recently acquired division of Elliott Co. Mr. Butcher has more than 30 years of experience in many phases of the electrical field, and has several patents to his credit, including an automatic switch used throughout the world to control circuit breakers in power supply apparatus of electric railway systems.

—o—

E. F. Luna, formerly advertising manager of Anaconda Wire & Cable Co., New York, has been appointed sales promotion manager of the company.

—o—

Walter J. Maytham Jr. has been appointed Pacific Coast district manager, Westinghouse Electric Corp., Pittsburgh. He takes over duties carried by **Charles A. Dostal,** vice president, who will retire next May after more than 43 years' service with the company, and who until his retirement will handle special executive assignments in the Pacific Coast district. Mr. Maytham will make his headquarters in San Francisco. He will be succeeded as manager of industrial sales in the Northwestern district, with headquarters in Chicago, by **A. M. Fisher,** who in turn is succeeded by **J. A. Holden** as manager of the Milwaukee office. **R. P. Wagner** has been appointed manager of the industrial products advertising and sales promotion department of Westinghouse, with headquarters in Pittsburgh. He succeeds **J. H. Thomson,** who has accepted a vice presidency with Electrical Publications Inc. in Cleveland.

Lloyd Wolf has been appointed chief engineer in charge of the engineering department of Twin Disc Clutch Co., Racine, Wis. He joined the company in 1947 as chief development engineer. During the war he was chief engineer of Army Ground Forces at Fort Knox, Ky., where he was primarily concerned with development of hydraulic power transmissions for the Army's heavy tank program. Previously he was associated with Gemmek Mfg. Co., Mechanical Handling Systems Inc., and Continental Motors and General Motors Corp. in engineering capacities.

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George C. Stamets has entered the employ of Wm. K. Stamets Co., Pittsburgh, as sales engineer. He assumes the position left vacant by the death of **James W. Chalmers.**

—o—

C. J. Moore, manager, Pittsburgh branch, has been appointed manager, Railway & Motive Power Sales Division, Exide Batteries of Canada Ltd., subsidiary of Electric Storage Battery Co., Philadelphia. He was supervisor of motive power sales from 1942 to 1946. Prior to employment by Exide Mr. Moore was with American Telephone & Telegraph Co. **C. H. Leet** has been appointed manager at Pittsburgh, succeeding Mr. Moore. Mr. Leet was a salesman in the industrial battery department, Pittsburgh branch.

—o—

E. O. Howard has been appointed sales engineer, Grinder & Titan Abrasive Divisions. Charles H. Besly & Co., Chicago. He will cover the northern Illinois area. For the last 11 years he has been manager of the Buffalo territory.

Griffith C. Taaffe, sales manager of Cincinnati Lathe & Tool Co., Oakley, Cincinnati, a subsidiary of Cincinnati Milling Machine Co., has been elected a vice president of the lathe company. He became associated with the parent concern in 1935, and previously had spent six years with the Cincinnati and Buffalo plants of Worthington Pump Corp. in various capacities. During the war Mr. Taaffe acted as technical adviser to the tools branch of the War Production Board, Washington, and subsequently established and operated the Washington office of Cincinnati Milling & Grinding Machines Inc., another subsidiary company. He later became manager of all field service and demonstration work, established and conducted the sales of Cincinnati Milling Machine Co.'s surplus products, in 1946 acted as special assistant to the sales manager of Cincinnati Milling & Grinding Machines Inc., and a year later became general sales manager, Cincinnati Lathe & Tool Co.

—o—

Clary Multiplier Corp., Los Angeles, announces appointment of **Marvin S. Bandoli** to fill the newly created post of vice president in charge of sales and distribution. For a period of years he was with Victor Adding Machine Co., Chicago, serving as a member of the board of directors and vice president in charge of distribution. He also was formerly national sales manager, Kelvinator Division, Nash-Kelvinator Corp., and vice president in charge of sales for Tracy Co., Pittsburgh. In his new post at Clary, Mr. Bandoli will have charge of a sales and distribution organization which includes 52 company-owned branches throughout the

Is PHYSICAL STRENGTH your magnet problem?

Mills agree that skull-cracking subjects a magnet to the roughest of service. Cautioning crane operators to "take it easy" is sage but frequently impractical advice.

Why not fit your magnet to the job when you buy?

Ohio *basket-type* magnets are specially constructed to withstand hard knocks. "Fenders" project beyond magnet diameter . . . stave off and protect against damaging blows.

For extra magnet life in rough service, install Ohio *basket-type* magnets. Write today to Ohio — 25 years a leader in *magnetic materials handling.*

Use "basket" construction for rough service

OHIO PROTECTO-WELD MAGNET is welded *on top,* where weld cannot be dented in. Sizes include 39, 46, 55 and 65-inch diameters. Ohio also builds magnet control equipment.

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ohio MAGNETS

A-2039

United States, more than 300 authorized dealers, and sales outlets in approximately 26 foreign countries.

—o—

Philip T. Coffin has been named

PHILIP T. COFFIN

manager of pig and ingot sales, and manager of the warehousing division for Aluminum Co. of America, Pittsburgh. Mr. Coffin joined the company in 1926. He served as works manager for the Alcoa-operated government-owned aluminum plant at Queens, N. Y., during World War II, and was made assistant manager of the New York district sales office in 1945. He succeeds **Hugo T. Wilder,** who was appointed manager of the company's newly created marketing division.

—o—

Carl T. Ulrich, vice president and treasurer, Kennecott Copper Corp., New York, and president of Kennecott Sales Corp., has been named chief executive officer of Kennecott Copper Corp., to serve until a president is elected to succeed the late **E. T. Stannard.** For reasons of health Mr. Ulrich has requested retirement early in 1950. **J. C. Kinnear,** vice president, has been elected a director of the corporation, and **Anton Gray,** chief geologist, has been elected a vice president.

—o—

Charles L. Jones, treasurer of Alan Wood Steel Co., Conshohocken, Pa., has also been elected secretary. **Howard W. Read,** a director, was elected assistant treasurer.

—o—

James C. Hartley, metallurgist, has been appointed a staff executive at Winchester Repeating Arms Co., division of Olin Industries Inc., New York, to handle special assignments for the regional manager at division headquarters, New Haven, Conn. He was previously vice president and general manager of Barium Steel & Forge Inc., Canton, O., where he had served as chief metallurgist and sales manager. Former associations include the position of director of research for Heppenstall Co., Pittsburgh, and chief metallurgist of Aluminum Forgings Inc., Erie, Pa.

—o—

Universal Atlas Cement Co., New York, subsidiary of U. S. Steel Corp., has announced these appointments in its operating department: **Francis A. Hennigan,** assistant to vice president-operations, New York, has been appointed plant manager at Hannibal, Mo., and **Arthur P. Lothrop,** assistant plant manager, Leeds, Ala., succeeds Mr. Hennigan. Mr. Lothrop will be succeeded by **Herbert W. Dieckmann,** who has been chief chemist and inspector at the company's plant at Northampton, Pa., since 1946.

—o—

John G. Benjamin has been appointed

JOHN G. BENJAMIN

sales manager, Abbott Ball Co., Hartford, Conn. He will succeed **J. J. Taylor,** resigned. Mr. Benjamin will be in charge of sales for both the bearing ball and burnishing divisions.

—o—

John Van Vleet has been elected vice president of manufacturing, a newly created position, for Line Material Co., Milwaukee, and **Herman Von Kaas** has been appointed assistant to Mr. Van Vleet, responsible for manufacturing engineering. **Tony Spaeth,** controller of the Zanesville, O., plant, has been placed in charge of a new manufacturing control department. The engineering department, divided into two specialized groups—product engineering and new product development—has named **Ralph Earle** as chief engineer, product engineering, in South Milwaukee, responsible for four plants throughout the country, and **Anthony Van Ryan,** formerly with the Kyle Division, heads the new product development.

—o—

Russell F. Weishuhn has been added to the staff of Hart Pressed Steel Corp., Elkhart, Ind., as a body and parts designer. A structural engineer, Mr. Weishuhn has had years of practical experience as the owner of a custom-body plant. He will be available on a consulting basis to body builders who are customers of the Hart organization.

—o—

L. O. Koven & Bro. Inc., Jersey City, N. J., announces appointment of **Kenneth H. Mac Watt** as director of engineering sales, succeeding **W. D. Birch,** resigned to assume more active control of his outside interests. Mr. Mac Watt has been associated with American Locomotive Co. where he held various positions in engineering and sales.

—o—

John G. Phillips, executive vice president and a director, International Business Machines Corp., New York, has been elected president to succeed **Thomas J. Watson,** who has been president since 1914 and who has now been elected chairman of the board and chairman of the executive and finance committee. **T. Vincent Learson,** district manager at Detroit, has been appointed sales manager, Electric Accounting Machines Division, succeeding **Gordon P. Lovell,** appointed dean of the IBM school in Endicott, N. Y. **Oliver Walker** was appointed assistant electric accounting machine manager, and **Paul Steinkuller,** assistant manager of customer engineering at New York.

—o—

A. J. Allen has been appointed gen-

A. J. ALLEN

eral sales manager of Coast Metals Inc., Canton, O. Before joining the sales and administrative staff

of Coast Metals, Mr. Allen was president and sales manager of Eastern Carbide Corp., New Rochelle, N. Y. Previous company associations included Firth Sterling Steel & Carbide Corp. and National Tube Co.

—o—

W. M. Griffith has been named district manager of the southern area, Pacific Coast territory, Superior Engine Division, National Supply Co., Pittsburgh. He will maintain headquarters at the Torrance, Calif., plant of the company where Pacific Coast activities of the Superior Engine Division are directed by **Lewis L. Livesley.** Before joining the division staff, Mr. Griffith served as sales head for Atlas-Imperial Diesel Engine Co., San Francisco.

—o—

C. **Jared Ingersoll** of Philadelphia, and **J. A. Elkins** of Houston have been elected to the board of directors of R. G. LeTourneau Inc., Peoria, Ill. **Elmer E. Isgren** has been appointed to the newly created office of executive vice president, and **Cyril D. Stapelton** has been appointed secretary.

—o—

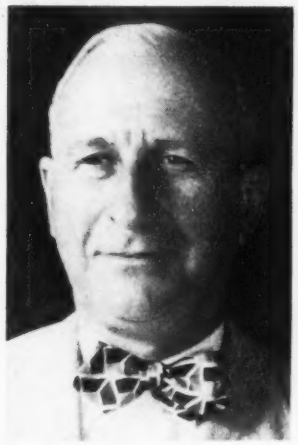
Clayton P. Innes has been promoted to manager of the Davenport, Iowa, branch office of Cutler-Hammer Inc., Milwaukee, succeeding **E. J. Karl,** retired. Mr. Innes has served 11 years in the company's sales organization, where he started as sales engineer at Davenport. Mr. Karl was Davenport manager for 15 years, and had been with Cutler-Hammer for 28 years.

—o—

David M. Whyte, formerly general foundry superintendent of the Grove City, Pa., and Mt. Vernon, O., plants of Cooper-Bessemer Corp., and recently head of D. M. Whyte & Associates, foundry consultant, Mt. Vernon, has acquired an interest in Bellville Foundries Inc., Bellville, O., and has been elected secretary-treasurer and general manager. The company specializes in light gray iron and alloy iron castings.

—o—

Howard D. White, executive vice president, Liquefied Petroleum Gas Association, Chicago, will resign Oct. 31 to become associated in a newly organized business at Albuquerque, N. Mex. He will be one of three owners of Perlite Development Corp. which will manufacture industrial furnaces for processing of perlite and develop new applications for the mineral. Mr. White will serve as secretary and promotion director of the new company. Associated with Mr. White in the new venture will be **J. V. Slavick,** president, and **Ray Leyen,** sales manager.



R. A. J. WELLINGTON

R. A. J. Wellington has been promoted to national sales manager of Precision Metalsmiths Inc., Cleveland. He assumes direction of a dozen Precision representatives located in industrial areas throughout the United States. Mr. Wellington has been associated with the machine tool industry for 20 years. He has had six years' experience in the precision metalcasting field, of which three and a half years were spent in charge of Precision's home office sales. During the war he was manager of the Cleveland branch of the Office of Production Management, serving from 1941 through 1943.

—o—

F. Penn Holter has been appointed manager of manufacturing, construction materials department, General Electric Co., at Bridgeport, Conn., succeeding **E. J. Harrington,** who has been assigned to the staff of the vice president in charge of manufacturing policy. Mr. Holter joined General Electric Co. as assistant manager of manufacturing in May of this year.

HENRY A. ROEMER JR.

Appointed vice president and general manager of Sharon Steel Corp., Sharon, Pa. Noted in STEEL, Sept. 19 issue, p. 68

Ralph C. Mark has been elected comptroller of General Motors Corp., Detroit, succeeding the late **R. E. Hammond.** Mr. Mark joined the corporation in 1931, and since 1947 has been director of the cost analysis section, comptroller's staff.

—o—

Buffalo Pumps Inc., Buffalo, announces election of **Henry D. Wilson** and **Bruce W. Ellis** to the board of directors. Mr. Wilson joined the engineering department of Buffalo Forge Co., parent organization, in 1927, and in 1942 was transferred to Buffalo Pumps Inc. as superintendent. Last August Mr. Wilson became factory manager, in which position he will remain. Mr. Ellis joined Buffalo Pumps Inc. in 1935 as an engineer, became assistant chief engineer and in 1944, chief engineer, in which position he continues.

—o—

John B. Hayes has been appointed sales representative for Electrode Division, Great Lakes Carbon Corp., Niagara Falls, N. Y., to handle sales of carbon and graphite electrodes and other carbon products in nine southern states. Mr. Hayes is head of J. B. Hayes Co., Birmingham, sales organization for products used by southern steel mills, foundries, and chemical plants. He was connected with Union Carbide & Carbon Co. for 16 years before founding his company in 1943.

—o—

J. T. Murnane has been appointed industrial sales manager for the Paint Division, Newark, N. J., of Pittsburgh Plate Glass Co., with which he has been associated since 1925. He represented the firm in the Baltimore district until his present appointment.

—o—

Wesley F. Rennie has been appointed executive director of the Committee for Economic Development, New York.

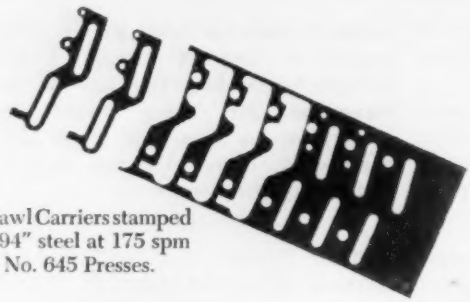
—o—

Iron & Steel Products Inc., Chicago, announces appointment of **J. J. Collins** to position of general manager.

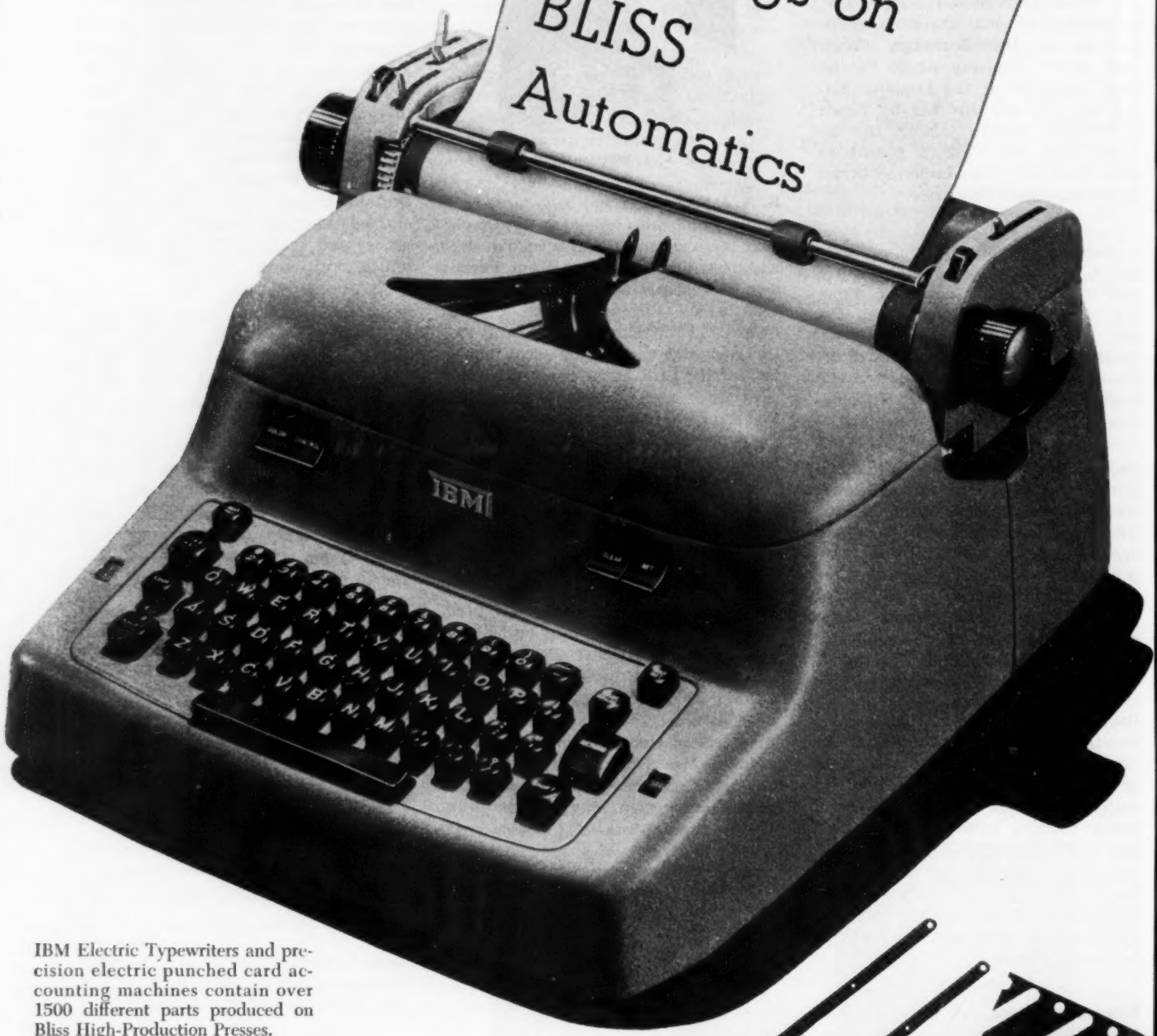
—o—

William L. McKnight, president, Minnesota Mining & Mfg. Co., St. Paul, since 1929, has been elected to the newly created post of chairman of the board, and will also act as finance committee chairman. **Archibald G. Bush,** formerly executive vice president for marketing and distribution, was named chairman of the executive committee. **Richard P. Carlton,** former executive vice president in charge of research, engineering and manufacturing, has become president.

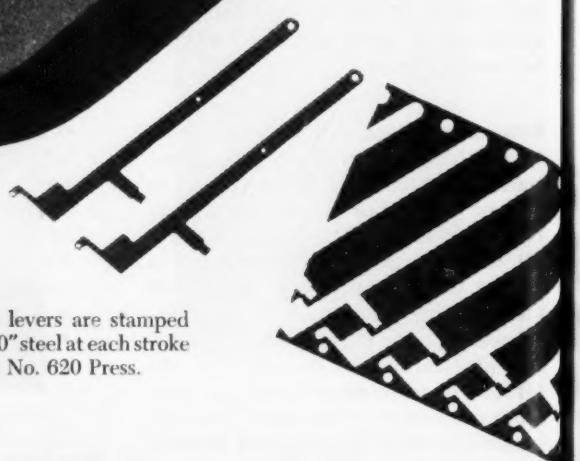
How IBM clicks off short-run stampings on BLISS Automatics



Index Pawl Carriers stamped from .094" steel at 175 spm in Bliss No. 645 Presses.



IBM Electric Typewriters and precision electric punched card accounting machines contain over 1500 different parts produced on Bliss High-Production Presses.



Two key levers are stamped out of .040" steel at each stroke of a Bliss No. 620 Press.

BLISS BUILDS MORE TYPES AND SIZES OF PRESSES THAN ANY OTHER COMPANY IN THE WORLD

Engineering News . . . AT A GLANCE

HIGH TEMPERATURE CERAMICS—Several ceramic bodies previously developed by National Bureau of Standards, Washington, are reported to have marked superiority in both strength and creep characteristics at 1800° F and above—even over best available high-temperature metal alloys. Tests indicate these bodies, especially designed for use in jet engines and gas turbines, possess special properties required at the high operating temperatures of these power plants. In fact, an experimental gas turbine using blades fabricated of the oxide body of the most promising strength and creep characteristics, operated successfully in the Cleveland Laboratory of NACA.

OIL BY THE MOLECULE—Molecular distillation, used to separate vitamins, hormones and other biologicals, now provides petroleum engineers with hydrocarbons not available through ordinary distillation. The process, which holds promise of better lubricants and more economical refinery equipment is being used by Texaco research scientists working with special vacuum machinery that spreads a layer of liquid only 300 molecules thick by centrifugal force and instantaneous heat.

NO MISTAKEN IDENTITY— In the huge rotary furnace employed by Standard Steel Works, Burnham, Pa., for controlled heating of individual steel ingots prior to press forging them into blanks that end up as wrought steel wheels, exact location and identification of each piece of steel in the furnace is known at all times. Charging operation is charted on a disk which is geared to and rotates with the hearth of the 75-foot diameter furnace. Work is processed through five independent zones in which temperatures are controlled automatically within very close limits. The furnace is equipped with complete automatic charging equipment consisting of work supply conveyor and charging peel similar to giant hands that pick up and deposit ingots weighing as much as 2500 pounds each on the furnace hearth.

SOLVED BY A LOOP— Use of a loop enables Atlantic Steel Co., Atlanta, Ga., to apply the unit-load principle in handling wire bale ties which when packaged, consist of a 9-foot, 76-pound bundle of individual strands. Twenty-five such bundles are "unitized" for economical handling by simply looping a strand of wire around each end of the load to form a sling. Loads then are carried from packaging operation to storage and eventually to weighing and shipping by a fork-lift truck equipped with a long ram in place of a conventional fork.

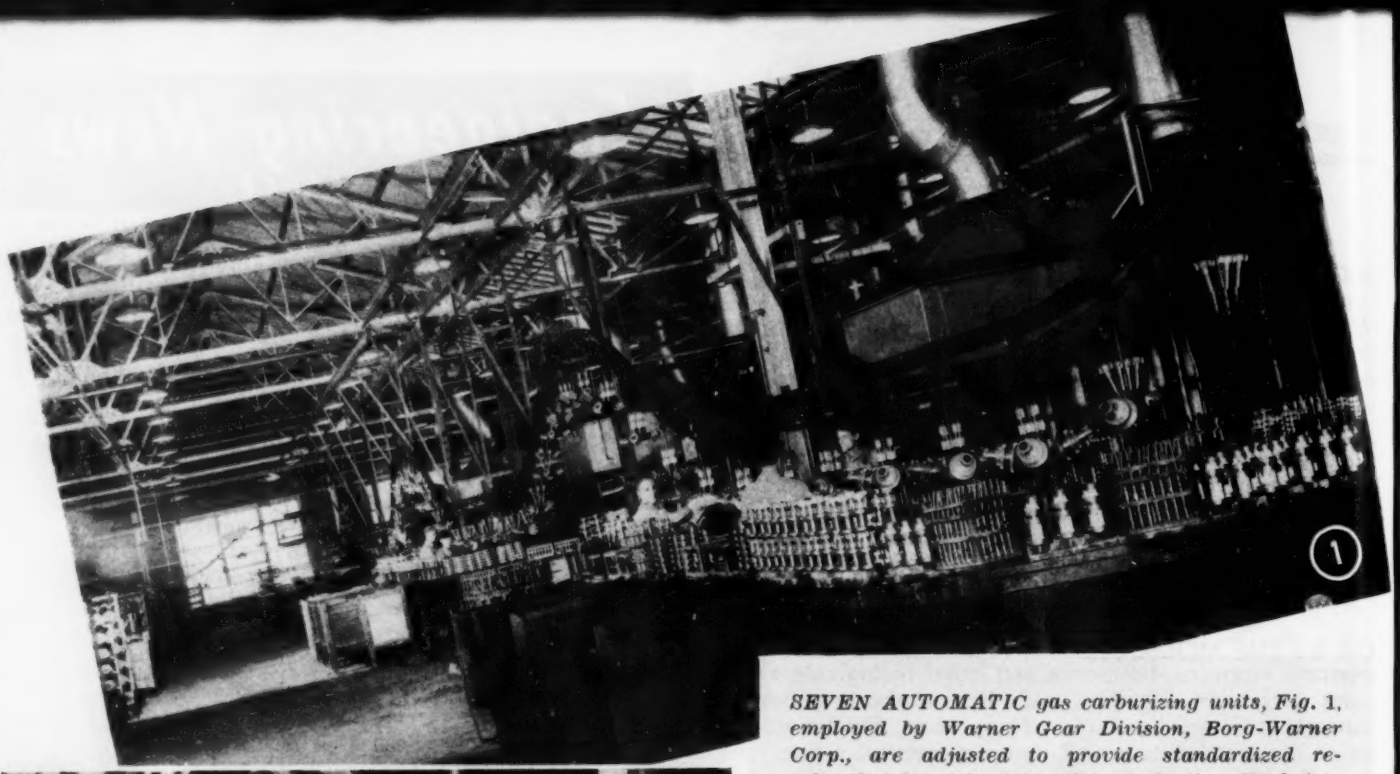
INSURES MATING DIES— Not too much is heard about die spotters. Yet these mechanical giants play an important part in automotive building. They are used to ensure perfect mating of the two halves of new or altered dies. Ford, in its River Rouge plant, employs a battery of eight Baldwin-built units—each including a "high-point" indication system that shows instantly where dies are to be dressed or polished. A pressure of 30 to 50 tons is exerted for die try-out with light gage metal. Although of great size, the die spotters actually are precision toolmaker's "instruments"—maintaining absolute die accuracy demanded in auto body construction.

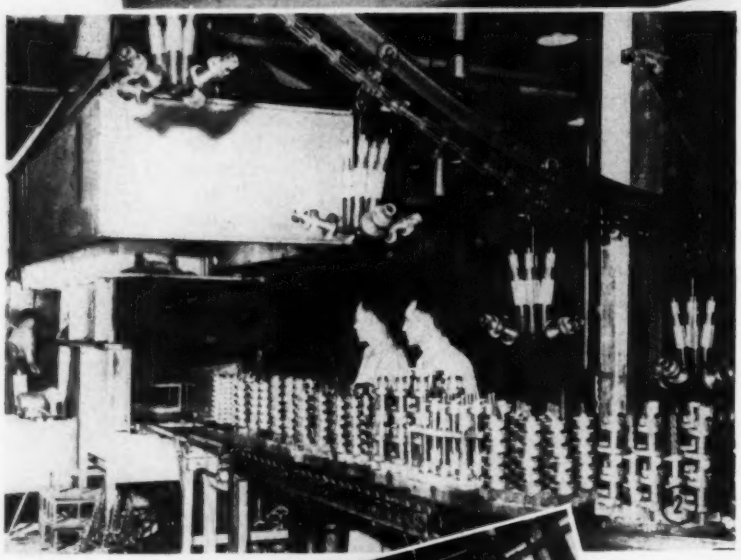
MINIMIZED INSPECTION—Standardized procedure of heat treating employed by Warner Gear Division, Borg-Warner Corp., Muncie, Ind., provides such uniform results that only periodic inspections are necessary for the million odd auto components produced each month. Installation here is considered one of the largest in the country—including seven continuous gas-fired radiant tube aromatic atmosphere furnaces each turning out 800 to 1000 pounds of work per hour. (p. 64)

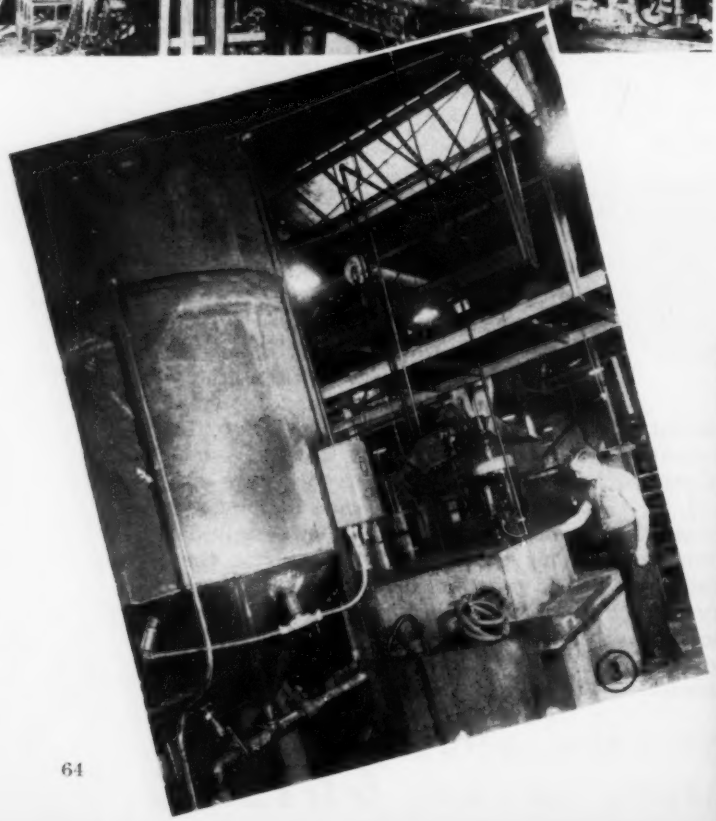
HANDY "TOOL"—Thirty years ago, few owners of cold roll forming machines, presses and other metalworking equipment gave much thought to rotary gang slitting. Since then, because of the greatly expanded use of slit-to-width strips, more and more small and medium-large users of sheet and strip are realizing the advantage and processing conveniences provided by slitters. A handy slitting line, it is pointed out, enables fabricators to manage with smaller inventories, since with a relatively small stock of mill-width coils or sheets they can in a few hours be ready to meet any expected or unexpected need. (p. 66)

COVERS BROAD FIELD—Few combinations of dissimilar metals exist that are not weldable to some degree, a study by the Resistance Welding Institute reveals. Many combinations can be welded as readily as low carbon steel under favorable conditions, taking into consideration, of course, shape and size of parts. Thus far the electrical industry holds the record for the widest range of combinations welded. (p. 72)

DOVETAILING OPERATIONS—Entire blast furnace charging system, consisting of stock house, scale car, skip hoist, small bell and distributor plus large bell, is such a closely interrelated chain that each unit must function properly or the entire operation fails. Thus each unit must be designed to function unfailingly during each furnace-filling cycle, timed to go into instant action. Importance of such co-ordination is illustrated by fact that a furnace producing 1440 tons of iron per day requires about 700 skip loads of material, or one every other minute. (p. 78)







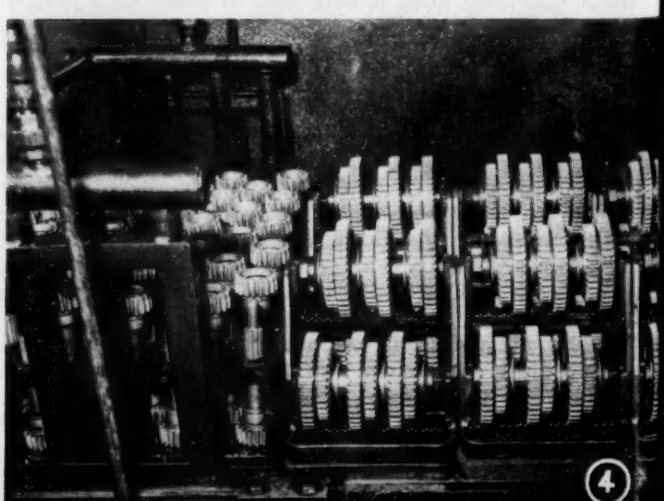
SEVEN AUTOMATIC gas carburizing units, Fig. 1, employed by Warner Gear Division, Borg-Warner Corp., are adjusted to provide standardized results that boost heat treating production. Each furnace is equipped with its own prepared atmosphere generator and complete automatic controls. Tons of gears are hauled each day on overhead conveyors.....

CONVEYING system, Fig. 2, and method of loading gears on special racks before entering furnaces for carburizing are shown here. As parts move through the carburizing atmosphere of the furnaces, a new batch is moved automatically onto the furnace conveyor.....

WHEN carburized, and arriving at the end of the furnace, Fig. 3, parts emerge through a gas lock and go into the oil quench without being exposed to air. This oil purification equipment for one of the furnaces takes sludge and water from the quenching oil and reclaims oil washed from gears subsequent to quenching.....

AFTER quenching, gears are washed and air dried as they pass through a gas-fired draw furnace like one above. Clean and scale free, Fig. 4, they are so uniformly heat treated that only periodic sampling is required in checking the million odd parts processed each month.....

DISCHARGE end, Fig. 5, of one of the furnaces showing pull-out mechanism and quenching zone. When work is completely processed, it is placed on the back line conveyors to be removed from the heat treating department. All photos courtesy Surface Combustion Corp.



LARGE-SCALE PRODUCTION *Carburizing*

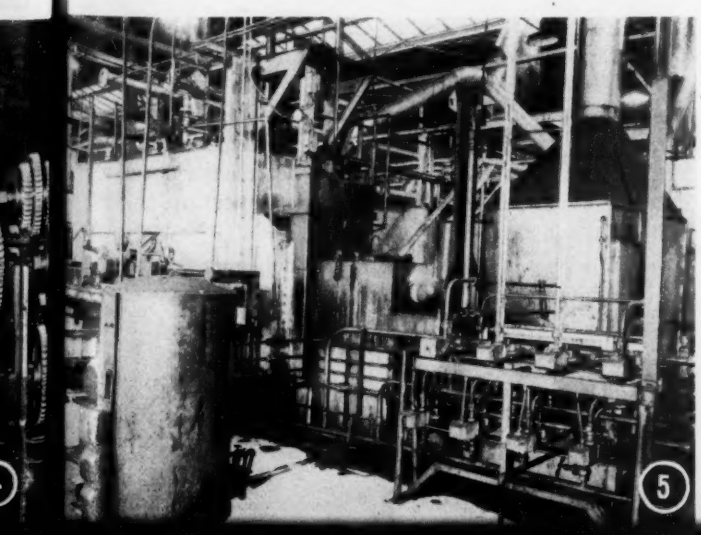
Results from Standardizing Heat Treating Procedures on Automotive Parts

UNIFORM products, increased production and economical loading of furnaces are direct results of standardizing carburizing procedures in processing gears, spline shafts and various other parts for automotive transmissions and over-drive units in the plant of Warner Gear Division, Borg-Warner Corp., Muncie, Ind.

Huge installation of automatic gas carburizing furnaces here, termed the largest of its kind in United States, includes seven continuous gas-fired radiant tube automatic atmosphere furnaces that each turn out 800 to 1000 pounds of finished heat treated components per hour. All of the furnaces are completely automatic throughout heating, quenching, washing, drying and drawing.

Parts are processed on a variety of fixtures, depending on their shapes and surfaces to be hardened. As each furnace is adjusted for a certain predetermined cycle, depth of case and size of part, the work is segregated and put through the proper furnace. By standardizing on depths of case—from 0.35 to 0.060-inch—and having companion cycle times for each case, the resulting products are so uniform that only periodic spot inspections are necessary for the million odd pieces produced monthly.

Conveyors Keep Parts Moving—To maintain a high production schedule and keep the furnaces operating at economical capacity, an elaborate system of conveyors is employed to bring various components to and away from the furnaces. A modification of the well-known automotive production line, the handling system consists of a combination of overhead, roller and swing type conveyors.



In the production sequence, holders containing the fixtures loaded with parts are sent on roller conveyors to each furnace vestibule. From there the furnace conveyor takes the load through the furnace at a preset cycle. This ranges from 9 to 18 hours, depending on the depth of case required, and section of the part. When parts complete their trip through a furnace they are automatically removed through a gas lock, which prevents escape of carburizing atmosphere, and passed into an oil quench without being exposed to outside air.

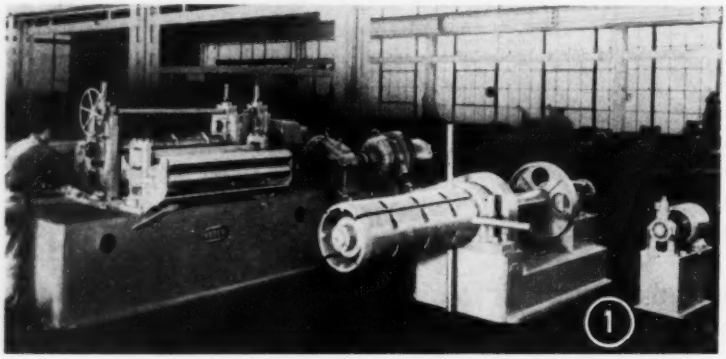
Operator Attention Minimized—From the quench, components go on to a wash which removes the oil, and into a gas-fired draw furnace at 350° F which also acts as an air dryer. Parts emerge at the end of the line bright and scale free. Entire procedure is under such close automatic control that a minimum of operators is required, and maintenance is relegated to normal wear of continuously operated mechanisms.

A battery of RX atmosphere generators supplies the furnaces with a carburizing atmosphere of 20 per cent carbon, 40 per cent hydrogen and 40 per cent nitrogen as the carrier gas, plus 1000 Btu natural gas for enriching. Dew point of the atmosphere is kept within 0 to plus 10° F. Furnaces themselves maintain a constant and uniform temperature of 1700° F, time cycle only varying with type of work.

During the weekend and holiday shutdowns, the company places the furnaces in suspended carburization operation rather than scheduling a production flow through the furnaces so the last part will come out late on Friday. While in this status, conveying equipment is stopped and temperatures in the furnaces lowered. Natural gas is shut off at the furnaces leaving only a carrier gas with a dew point of plus 50° F as the holding atmosphere. This atmosphere is essentially in equilibrium with the carbon content at the surface of the steel during the suspension period. This condition is maintained until production resumes and furnace temperatures are again brought up to 1700° F. The method reduces production costs by eliminating a wait of 9 to 18-hour cycle for parts and time required to bring the furnaces up to proper heat.

ROTARY GANG

An Effective Production Tool



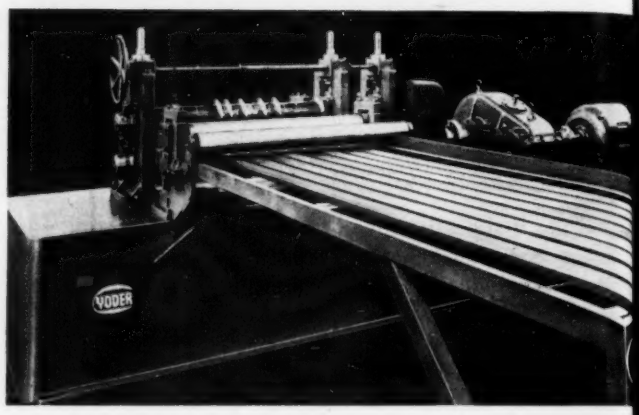


Fig. 1—Slitting line, with expanding drum uncoiler, slitter and pull type recoiler, for coils only. The slitter can be arranged for slitting both coils and sheets

Fig. 2—Sheet slitter with entry table, for flat sheets in cut lengths only

Fig. 3—High speed drive slitting line in sheet mill, equipped with adjustable direct current motor. This line has been operated at a speed of 1200 fpm

PART I

THIRTY years ago, very few owners of cold roll forming machines, punch presses and other metalworking equipment had given much thought to the subject of rotary gang slitting, usually depending entirely on outside sources for their supply of slit-to-width sheet metal. Since then, owing to the enormously expanded use of slit-to-width strips, most warehousemen have found it profitable to operate one or more rotary gang slitting lines. The same may be said about sheet metal fabricators using big tonnages. In recent years, more and more of the small and medium-large users of sheet and strip have also installed slitters.

Trend in this direction apparently is accelerating due to increased appreciation of the convenience and economy of having a slitter available on the premises for regular as well as emergency use. Because of the very low break even point of rotary gang slitters, this equipment may be operated for only a few days per month and still be a very good investment.

Smaller Inventories—A slitting line enables fabricators to manage with much smaller inventories, since with a relatively small stock of mill-width coils or sheets they can in a few hours be ready to meet any expected or unexpected need for slit-to-width strands. Deliveries of mill-width stock, obviously, can be obtained more promptly and at a lower cost than of slit-to-width strips.

The term "slitting line" herein includes an uncoiler, a slitter and a recoiler, with or without a scrap chopper or other accessories. In such a line, the slitter may be additionally equipped so that it may also be used for slitting flat sheets. The term "sheet slitter" is understood to mean a slitter suitable only for flat sheets in cut lengths. For coiled stock a complete slitting line is necessary.

The earliest rotary gang slitters were made for cutting flat sheets only, and consisted of a single machine, which had to be powered for driving the slitting arbor. When the slitter came to be used also with an uncoiler and recoiler for slitting coils, complications arose in synchronizing the speed of the recoiler or takeup reel with that of the slitter itself. The recoiler has to exert a constant pull on the slit strips so as to insure tight rewinding, but the amount or degree of tension required for this purpose varies with the number of strips being cut, their thickness and width.

Another difficulty lies in the fact that the slitter speed in terms of revolutions per minute and feet per minute remains constant, while the recoiler speed with a positive drive remains constant only in terms of revolutions per minute. As the slit strips are being rewound on the recoiler drum, the peripheral speed in feet per minute increases in direct proportion to the buildup in coil diameter.

For the purpose of obtaining synchronized cutting and rewinding speed with a drive slitter, various methods are available about as follows:

1. Magnetic slip clutch on the recoiler.
2. Mechanical slip clutch for the recoiler — the

GSLITTING

By EUGENE L. MACKEY
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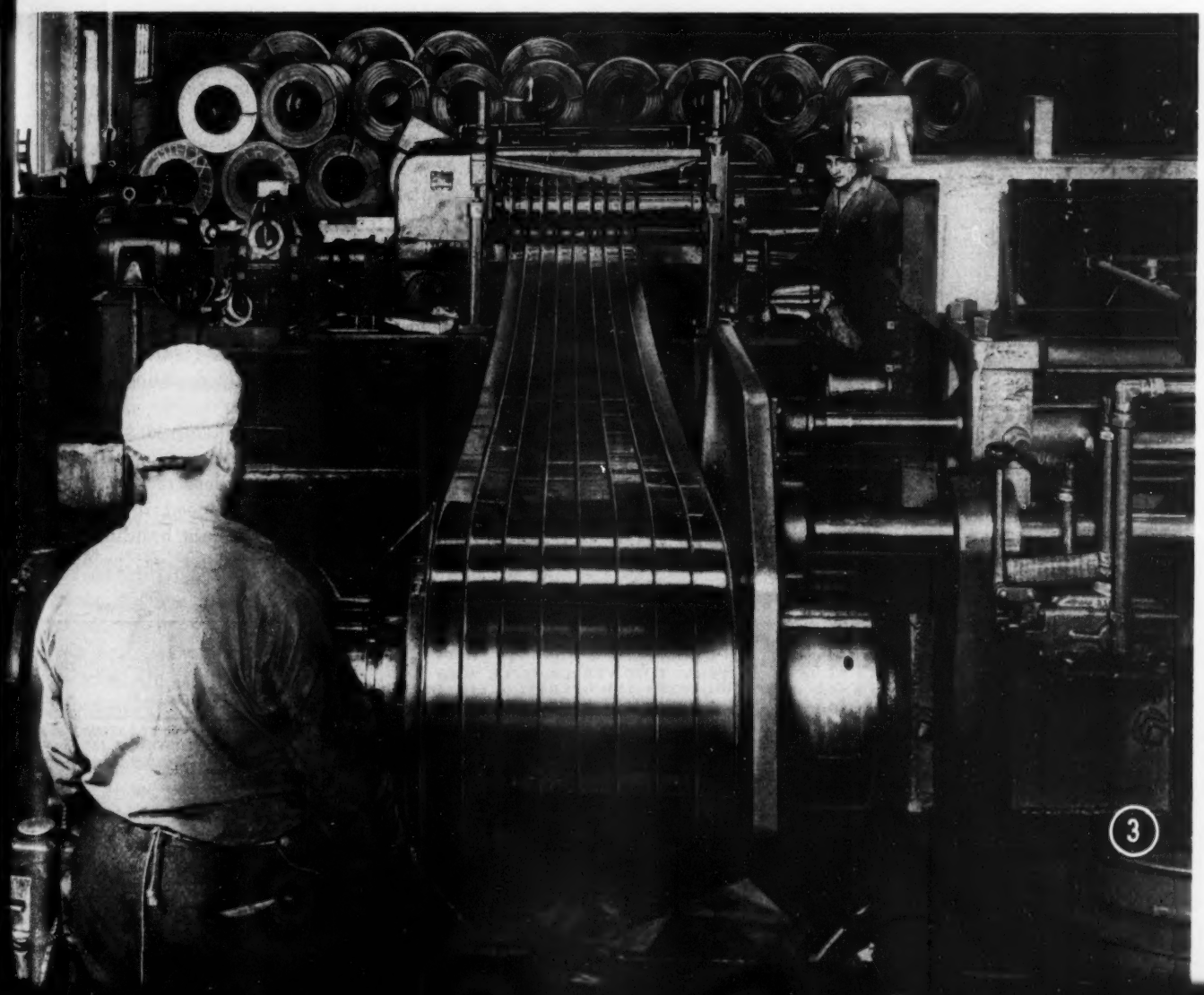
Rapidly increasing use of coiled strip and sheet metal in recent years has paced the development of fast-operating, flexible slitting equipment. In this first section of a three-part article the author reviews the relative advantages of drive and pull-type slitting lines and considers some of the factors in selecting and operating slitting lines, ratio of slitting time to total cycle time, advantages and disadvantages of large coils, high speeds and coil cars

clutch being spring, hydraulic, or air-loaded.

3. Adjustable speed direct current motors, either manually or automatically controlled. (Manual control requires constant attention of operator.)

Pull-type Recoiler—Choice between these different types of speed control equipment is difficult, as each of them has distinct advantages and disadvantages. In relatively recent years, in an effort to simplify construction as well as operation, the pull-type recoiler was introduced. It was found that for most purposes slitting could be accomplished just as successfully by merely pulling the stock through the slitter. This completely eliminated the need for speed synchronization and the resulting operating difficulties. Since then, to distinguish one from the other, they have been referred to as the drive-type and the pull-type respectively.

In the transition period from drive to pull-type slitters, some pull-slitting lines were built which were also equipped with slitter motor and mechanical slip clutch recoiler, so that if pull-type operation should at any time fail to perform satisfactorily, drive slitting could be resorted to by allowing the slip clutch to operate, engaging the slitter drive. It gradually



became apparent, however, that the occasion for resorting to drive type operation arose so seldom that most operators after a few years were not even aware of the existence of the optional drive on their slitters.

Where large tonnages of stock heavier than 0.125-inch are to be slit, the amount of power required in pull-slitting is somewhat in excess of what it is in drive-slitting. However, some large fabricators, especially in the automotive lines, attach so much importance to simplicity and ease of operation that they prefer the pull-type even for stock over 0.125-inch thick. Pull-type slitters have, as a matter of fact, been built in capacities up to 0.025-inch.

Standardized Slitters—Development of standardized slitters was started immediately after the first World War. The first standardized slitter, designed for sheets only, had a single pair of rotary cutters mounted in the jaw of a shear type cast iron base. Several of these machines have been in constant use for nearly 30 years and are still doing good work.

This type of machine, with intervals of a few years, was followed, first by multiple sheet slitters, then by drive slitting lines for coils, and finally by pull slitting lines, all of them modern rotary, multiple type.

At first rotary gang slitters were custom-built to individual specifications, mostly for rolling mills, but the demand for smaller slitters increased so steadily that standardization ultimately became possible in a range of sizes for slitting coiled stock up to 0.125-inch thick and 36 inches wide. This range covers a major portion of the annual sheet and strip metal production in the United States and foreign countries.

A close inspection of many slitters reveals the fact that the design and construction of the drive and drive housing, gearing, outboard housing, cutter arbor, top arbor adjustment with micrometer gages, bearings, and other parts, as well as their arrangement and assembly, are either identical or nearly so, with those used in certain roll forming machines.

Selecting and Operating Slitting Lines—In spite of the high output and low unit cost of a slitting line, the fact remains that even with the most experienced operators only from 10 to 20 per cent of the total cycle time represents actual slitting time when working with coils of average size. In general, methods available for increasing slitter production may be divided into three classes, as follows:

1. Investing in heavier equipment, capable of handling coils of correspondingly heavy weight and large sizes.
2. Equipping slitters for higher speeds.
3. Providing more and better materials handling equipment, banding entirely off the recoiler.

Before discussing these various possibilities, it should be pointed out that they are of interest mainly in plants where tonnages to be slit are so large as to crowd the capacity of the slitting equipment; also, that the output of the standardized slitter is normally so large that most fabricating shops do not have sufficient work to keep them continuously busy. In fact, a slitting line will often justify itself when operating only one day out of five or six.

Those who have had limited experience with slitter operation and capacities, may be interested in considering a few typical cases. Assume coils weighing 5240 pounds, 16-inch core, 32-inch OD, the stock being 36-inches wide by 0.062-inch thick, to be slit into six strands in a standard slitting line.

An electric fork truck or crane is used for bringing up coils and loading them on the uncoiler, and also for removing the slit coils from the recoiler to a banding bench. The slitter crew consists of an operator and two helpers. With coils as stated, these men average one coil every ½-hour, or 16 coils per day. This is considered very good performance.

It figures out to a daily production of 5240 x 16 = 83,840 pounds, or nearly 42 tons. The standard speed of the slitter is 225 fpm, measured around the bare drum diameter, which is 16-inches when expanded. Assuming that the average speed of the strip in this case is 325 fpm, how much could the daily output be increased by (1) using coils of the same width but greater diameter, and also (2) by doubling the average speed?

Actual Slitting Time—At the average speed mentioned, the actual slitting time for the coil would be only about 2 minutes. Regardless of how big the coils are, or how high the slitting speed, it is assumed that the time required for materials handling, loading, threading, attaching to recoiler, stripping and

TABLE I

SLITTING TIME VERSUS CYCLE TIME
EFFECT OF DIFFERENT SPEEDS AND COIL DIAMETERS ON TOTAL CYCLE TIME

	Coil Length, Weight and Diameter					
	690 Feet		2000 Feet		3000 Feet	
Slitting Coiled Stock, 36" wide, 0.062" thick, six cuts	32" O.D. 5,240 lbs.		48" O.D. 15,000 lbs.		60" O.D. 22,500 lbs.	
Steps in Cycle	Average Speed, Feet per Minute					
	325	650	325	650	325	650
1. Removing bands and loading on uncoiler....	x	x	x	x	x	x
2. Threading	x	x	x	x	x	x
3. Attaching 6 strands and placing separators	x	x	x	x	x	x
4. Placing one band and stripping off recoiler...	x	x	x	x	x	x
Total for above operations, Minutes..	28	28	28	28	28	28
Slitting time, Minutes	2	1	6	3	9	4½
Total Cycle Time....	30	29	34	31	37	32½

TABLE II

SLITTING TIME VERSUS CYCLE TIME
STOCK THICKNESS 0.031", COIL SIZES AND OPERATING SPEEDS SAME AS IN TABLE I

All Stock 36" wide, 0.031" thick	COIL LENGTHS, WEIGHTS AND DIAMETERS					
	1380 Ft., 5240 Lbs. 32" O.D. & 16" Core		4000 Ft., 15000 Lbs. 48" O.D. & 16" Core		6000 Ft., 22500 Lbs. 60" O.D. & 16" Core	
Steps in Cycle	325 FPM	650 FPM	325 FPM	650 FPM	325 FPM	650 FPM
Slitting Time, Minutes	4	2	12	6	18	9
Loading, threading and all other Operations as in Table "I"	28	28	28	28	28	28
Total Cycle Time, Minutes	32	30	40	34	46	37

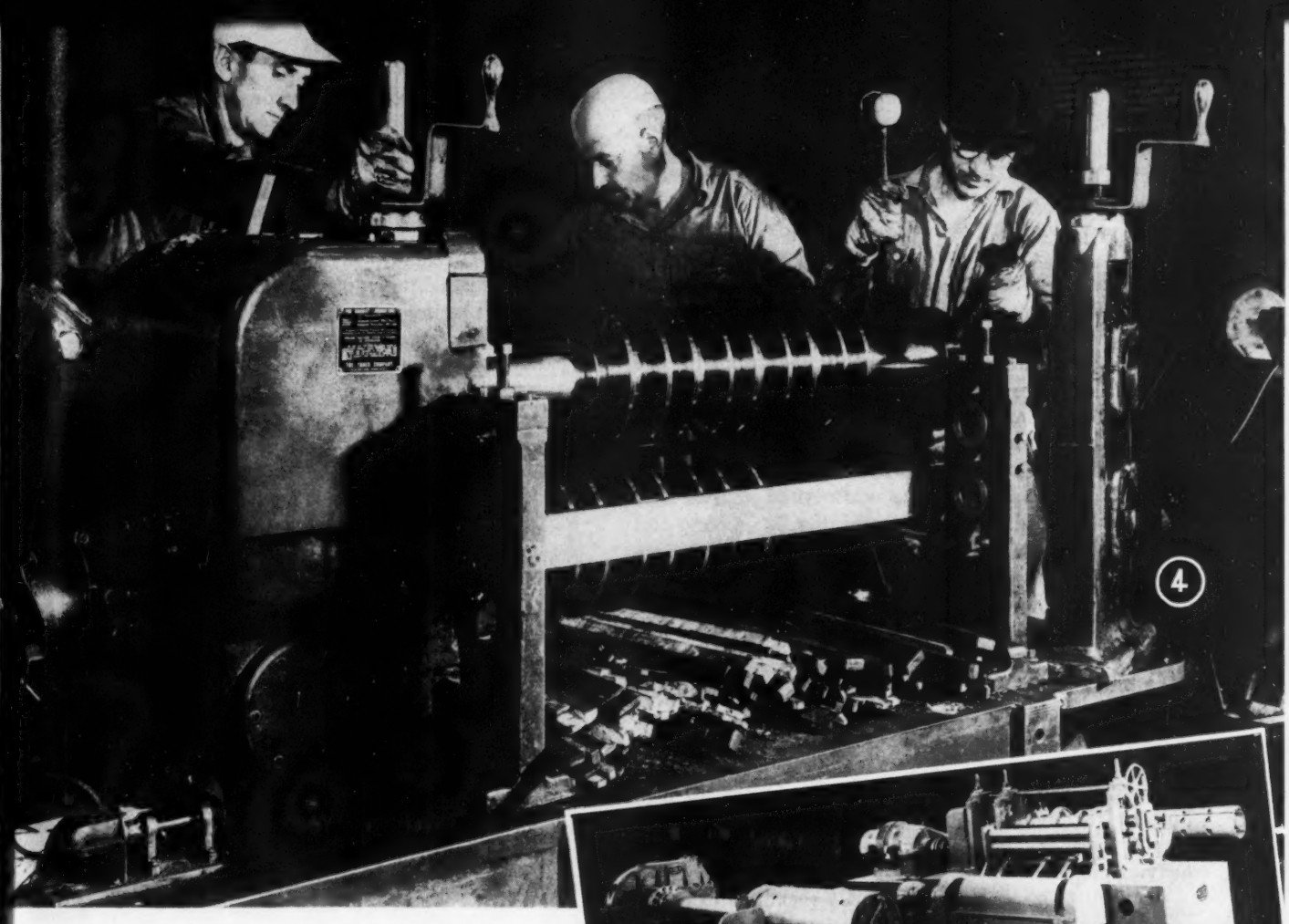


Fig. 4—Standardized rotary gang slitter. Operators have removed the outboard arbor housing and are changing cutter setup

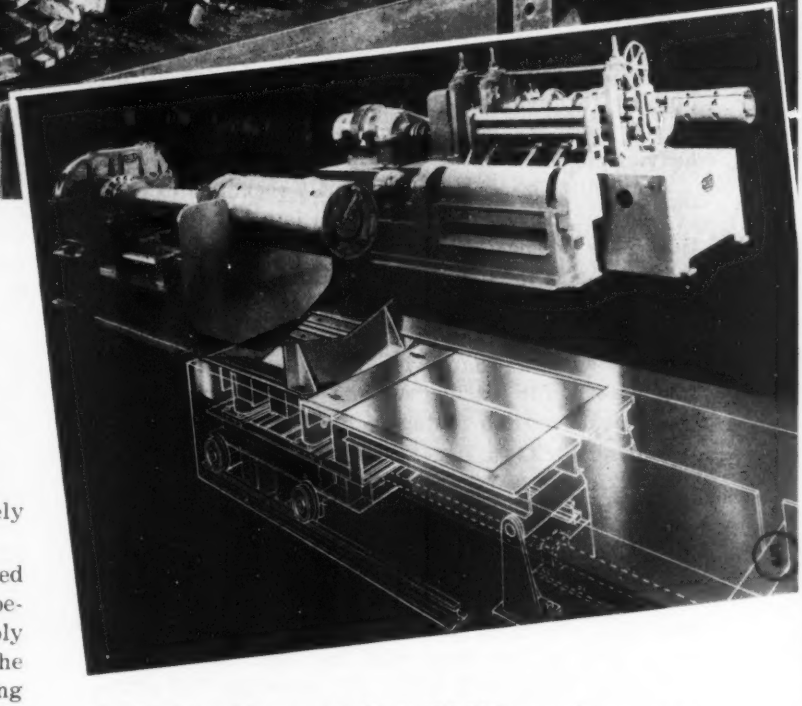


Fig. 5—Photograph of slitting line with drawing of coil car and accessories in pit under recoiler drum. Hydraulic cylinder, indicated in broken lines, is for traversing the car, and is necessary only for loading the uncoiler

banding will remain about the same, approximately 28 minutes.

To increase the size of coil and speed as stated would, of course, also imply the installation of a special large size uncoiler and recoiler, at considerably higher cost, while the same slitter would serve the purpose. Also, a larger lift truck or other handling equipment might also be necessary.

Table I shows how little the cycle time would be affected by the handling of larger coils, at higher speeds.

Actual slitting time is easily calculated for one of these speeds and coil sizes and varies, as will be seen, all the way from 1 up to 9 minutes per cycle or per coil. In spite of this great difference in slitting time, the total cycle time varies only between a minimum of 29 minutes and a maximum of 37 minutes.

Daily production with the smallest coils and the slowest speed in this case, is seen to be 42 tons, while with the largest coils, at the same low speed, in spite of a slitting time nine times greater, the daily output is raised to 22,500 pounds x 13 (the number of cycles per day) making a total of 292,500 pounds, or over 146 tons.

In other words, simply by installing a larger slitting line, designed to handle coils up to 60-inch diameter, weighing 22,500 pounds, the daily output might be stepped up about 350 per cent.

But the important question is: "Can we use or sell anything like 146 tons of slit strips per working day?" If we cannot, we shall be much better off with smaller coils initial investment.

Many prospective purchasers are constantly asking for quotations on equipment far too large and too expensive to be economical for their tonnage requirements. The most common error is to overestimate maximum coil weights to be handled, with the result that the initial investment may go up far above anything

they are prepared to pay. Thus, it is a common experience to find that coil weights, first estimated at 15,000 pounds, or more, are actually only about half that much. This alone would add a good many thousand dollars to the cost of the uncoiler and recoiler required, also increasing operating and maintenance cost.

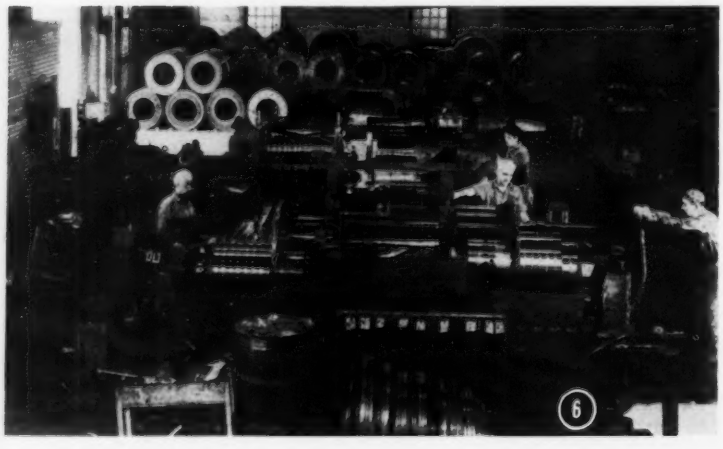
If, however, the larger coils can be purchased at considerably lower base prices, this might change the showing in favor of the heavier equipment, provided, however, that the daily or monthly requirements are sufficiently large to warrant the larger investment. The factor of flexibility also enters into the picture, as certain advantages might be gained by having several small slitters instead of one big one, especially for the slitting of a large variety of gages, coil weights and number of cuts per widths.

How Stock Thickness Affects Output—Let us see what would happen where the stock thickness is reduced, say by one-half, to 0.031-inch instead of 0.062-inch as in the case just cited. Assume that coil weight, width and diameter remain as before, so that the total footage in the coils would be doubled. This is shown in Table II.

Again we see that the fluctuations in total cycle time remain relatively small, while the slitting time is doubled, ranging from a low of 2 minutes up to a high of 18 minutes. Production, in pounds per hour, would therefore not be much smaller than for the heavier gages.

Since slitting speed is necessarily reckoned in terms of feet per minute, it might seem logical to base slitting costs or charges on length rather than weight of stock to be slit. Actually, due to the relatively small proportion of slitting time in the total cycle time, the daily output with the thinner stock as a rule is only slightly smaller than with heavier gages. This is the reason for basing custom slitting charges on weight rather than footage.

Slitting for Own Use—Where slitting is being done for use in the same shop, as in tube mills and fabricating shops, with very little rehandling of the slit coils, it is generally satisfactory to place only one band on each coil, namely around the circumference. In a typical operation of this kind, coils 32 inches in diameter, averaging 4800 pounds, are slit at intervals by a crew of two men who are kept busy on miscellaneous other jobs when not operating the slitter.



Cutting five strips, the time consumed for each of the steps in the cycle is about as follows:

Breakdown of Cycle	
1. Picking up coil with crane and loading on uncoiler	5 min.
2. Threading through slitter, attaching to recoiler, placing separators and locking in place	5 min.
3. Slitting	4 min.
4. Single Banding and Unloading	11 min.
Total Cycle	25 min.
Number of Cycles per day, allowing for avoidable and unavoidable interruptions	16
Tonnage per 8-hour day $\frac{4800 \times 16}{2000}$ =	38.4 tons
Total length of slit strips per day $1200 \times 16 \times 5$ =	99,020 feet

In this case the average stock thickness and width was 0.038 and 32 inches, respectively. The approximate weight per 100 feet, is 12.92 pounds × 30 = 387.60 pounds. Mill-width coils are kept in storage close to the slitter, and are picked up and placed on the uncoiler by a crane serving other purposes in the same bay. Most of the other bays have similar cranes, so that waiting time is reduced to a negligible point. The equipment consisted of a coil slitter 36 inches wide with an uncoiler and a pull-type recoiler.

As previously pointed out, the production in pounds or tons per day would be only slightly increased with increase in stock thickness, unless the size of coils was simultaneously increased.

In this case, if the stock thickness had been 0.125-inch instead of 0.036-inch, each coil containing the same length of stock, instead of weighing 153 pounds per inch of width, would weigh 153 × 0.125/0.036 = 531 pounds, or total for the 32-inch width of 531 × 32 = 16,992 pounds. Such a coil would have an outside diameter of 54 inches and be too large and heavy to be handled on a standard size slitting line.

Low Break-even Point of Slitters — In a certain plant operating two electric-weld tube mills and about 50 punch presses, one standard size slitting line does the slitting for all machines by operating an average of only 7 hours per 40-hour week. In another plant, one slitting line operated from 6 to 8 hours per week, is supplying two intermittently operated roll-forming machines using about 100,000 feet of strips per week.

These two examples are *(Please turn to Page 88)*

Fig. 6—Sheet mill installation of single slitter with double swiveling uncoilers and recoilers. While one coil is slit (left) the previously slit stock of coils is removed from drum (right). Next, the double uncoiler and recoiler will be revolved 180 degrees, bringing the newly-loaded uncoiler and empty recoiler drums into line with slitter, starting another cycle

SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
Machine Tool Editor

MIGRATION OF INDUSTRY: Study of the reasons for and effects of migrations of tribes and races always has been important in understanding the human side of history. Not so much attention has been paid, however, to the reasons for and the effects of migrations of industry. In these days of large, highly organized industries, their migration has a tremendous effect not only on the human side of history, but also on the economic balance of the country.

A few days ago, Earl Shaner, editor-in-chief of STEEL, got to reminiscing with me about the migration of some of the industries with which he was acquainted years ago in the neighborhood of Olean, N. Y. One was the glass industry which, in the days before mechanized glass blowing, used to exist in small units where cheap natural gas was available. When the gas "played out" in one neighborhood, these small glass works—like the old-time tin mills—would pull up stakes and "follow the gas", usually westward. Eventually mechanized methods made big business out of glass making and most of the small companies faded out of the picture completely.

Another example which he mentioned was the leather tanning industry, which used to exist in small units in neighborhoods where hemlock bark for brewing tanning liquor was plentiful and cheap. As the hemlock disappeared, so did most of the small tanneries in the Southern Tier of New York State. Many of them reappeared in northern Michigan. Finally when cheap imported tannic acid became available, hemlock bark no longer was important. Then tanning became big business in centers like St. Louis and Kansas City—nearer the big sources of hides.

The peculiar thing about industrial migration is that it is apt to be unsuspected by the people of a community until it is too late to do anything about it. The same thing is true of the impending death of an industry because of technological changes—as, for instance, the death of the buggy whip industry in western Massachusetts. An industry seldom is appreciated fully until it has departed or died. Only then is it realized how difficult it is to replace an established industry.

Many industrial migrations could have been forestalled—and many "dead" industries could have kept alive—by managerial and engineering foresight and by more friendly and understanding interest on the part of influential people in the community—including bankers and chambers of commerce. That is true particularly of metalworking industries. Right now many established companies of long-standing may be on the verge of consolidation with some other companies in distant places—or they may be on the verge of going out of business because of obsolescence of products or methods, or because of labor troubles.

If an industry does migrate, or if it does liquidate, everybody suffers all the way from the top-flight bankers to the corner grocers. On top of all that, a lot of good citizens will leave town. Therefore, if the enterprise can be held in town, or if it can be revived, a human and economic upset can be avoided.

In more cases than not, a manufacturing business can be held, or it can be revived, if workers, engineers, management, bankers, the chamber of commerce, and the town's people will recognize the situation in time and then get their shoulders to the wheel and push. Of course, it will take some real effort, and probably some money, but nothing like the effort and the money required to establish and to build up an equivalent new industry.

BUILT-IN MICROMETERS: For 50 years or more lathes, turret lathes and certain other machine tools have been equipped with various kinds of "engine divided" thimbles, sleeves, dials and disks on their cross feed screws. The purpose of these is to facilitate tool setting to desired diameters of work—the principle being that of the familiar micrometer.

From relatively crude beginnings—crude because neither the dials nor the screws to which they were attached had anything of micrometer accuracy about them—these devices now have been developed to the point where they really are "built-in micrometers".

I have had occasion lately to observe the care which lathe builders are devoting to the design and construction of the slides, screws, nuts and dials which go to make up these built-in measuring devices. The work is on a par with that which goes into a bench micrometer—an instrument generally thought of as being confined to the inner sanctum of the gage department. This is just one more bit of proof for my conviction that the workmanship and the working limits on fine machine tools in many respects are catching up with those of the gage makers, just as methods of gaging are catching up with production as far as speed is concerned.

The advent of hardened and ground precision screws has had a lot to do with making the built-in tool setting devices on machine tools useful in connection with finishing cuts as well as roughing cuts. Nuts without backlash and slides without "shake" also contribute their share. Without those refinements, all the care which is lavished on the making, dividing and mounting of the large diameter measuring dials and drums (including verniers in some cases), the ingenious clips for preserving settings for repetitive operations, the built-in counters for facilitating readings, etc., would be useless.

They certainly are useless if the operator does not use them—as I suspect is the case all too often. They do require a bit of preliminary study on the part of the operator, but once he gets the hang of them, they will repay that study 100 fold in more and better work and less operational anxiety.

Welding DISSIMILAR

If similar metals are spot welded, high resistance is between the interfaces of the two sheets, but in case of dissimilar metals, highest resistance may be located in one of the metals. Article discusses problems encountered and the approach to their solution

AMONG chief reasons why resistance welding has gained its present acceptance as a flexible production process lies in its demonstrated ability to join efficiently dissimilar metals. Consequently, it is important, from a cost and profits viewpoint, for manufacturers who face such an industrial problem to learn just how well resistance welding can do the job.

In resistance welding the amount of heat generated depends primarily upon the current flowing through the pieces to be welded and the resistance. The resistance can be classified according to its three components: 1. The resistance between the two pieces to be welded; 2. the specific resistance of the pieces; and 3. the resistance between the electrode and the work.

If similar metals are spot welded, then the highest resistance is between the interfaces of the two sheets, provided that the correct welding conditions are used. In the case of welding two dissimilar metals, such as stainless steel to brass, the maximum resistance may not exist

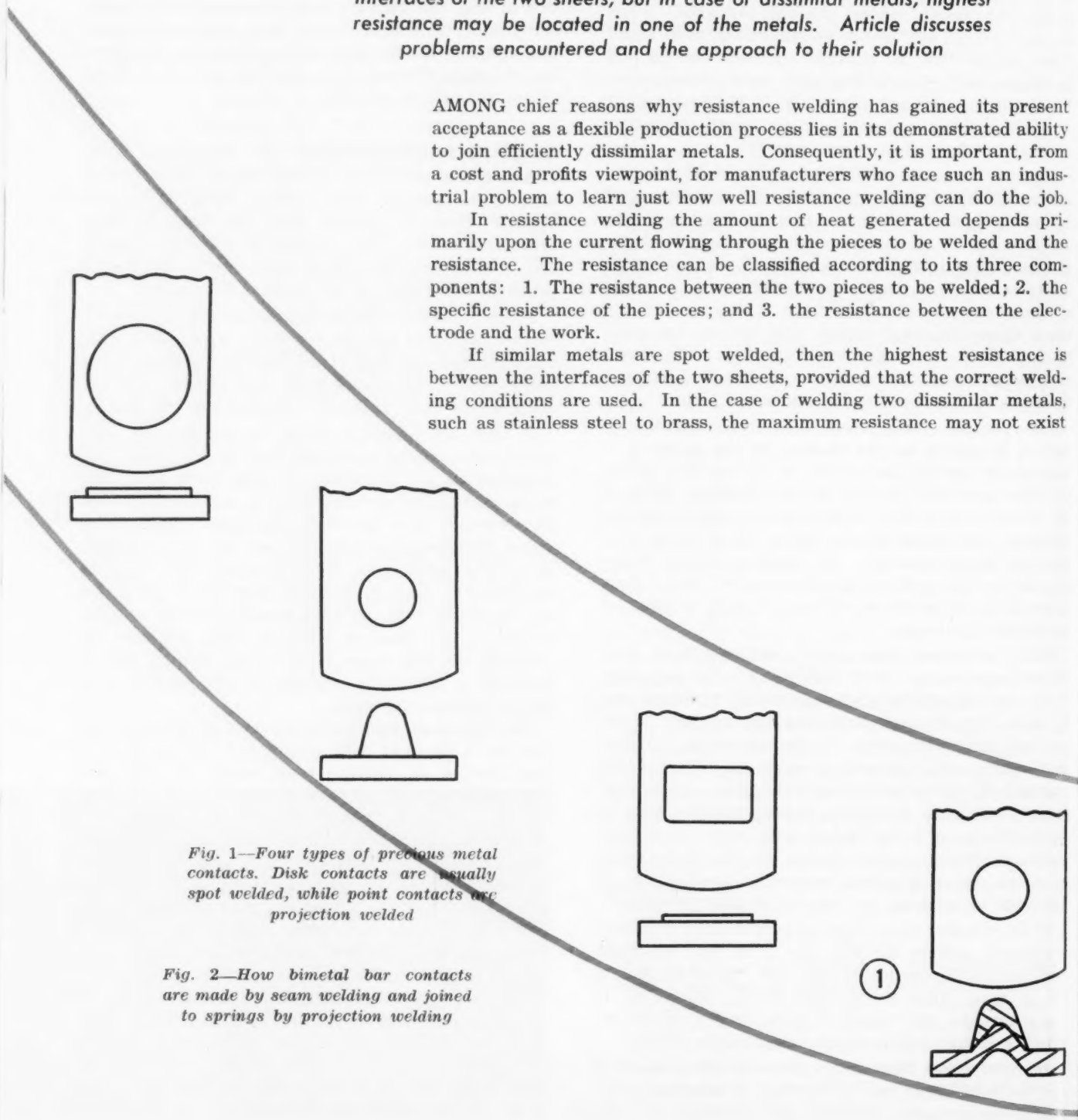


Fig. 1—Four types of precious metal contacts. Disk contacts are usually spot welded, while point contacts are projection welded

Fig. 2—How bimetal bar contacts are made by seam welding and joined to springs by projection welding

METALS

between the interfaces of the two sheets, but may actually be located within the stainless steel sheet, due to its very much higher specific resistance, as compared to that of the brass sheet. The actual heat which is created in the stainless steel and in the brass will be proportionate to the specific resistance of the two materials.

Problem of Heat Loss—Furthermore, it must be taken into consideration that, due to the low specific thermal resistance of brass, the heat losses in brass will be higher on account of heat being conducted to the cooler parts much more rapidly. An extreme case of difficult welding conditions is thus presented; nevertheless it has been possible to accomplish spot welds of acceptable strength for some purposes in this combination. More favorable welding conditions in this combination could probably be obtained by using one of the stabilized types of stainless steel and a yellow brass containing a small amount of silicon. Such design compromises are worthwhile on account of improvements in production rates and weld quality.

Has Wide Usage—Application of the resistance welding processes to the joining of dissimilar metals has had an important role in the manufacture of many types of apparatus. The electrical industry has furnished the widest range of combinations to be welded, and special procedures and machines for the successful welding of these combinations. Experience has shown that all types of resistance welding may be used and that there are few combinations of dissimilar metals which are not weldable to some degree. Many combinations can be welded as readily as low carbon steel, under favorable conditions as to shape and size of parts.

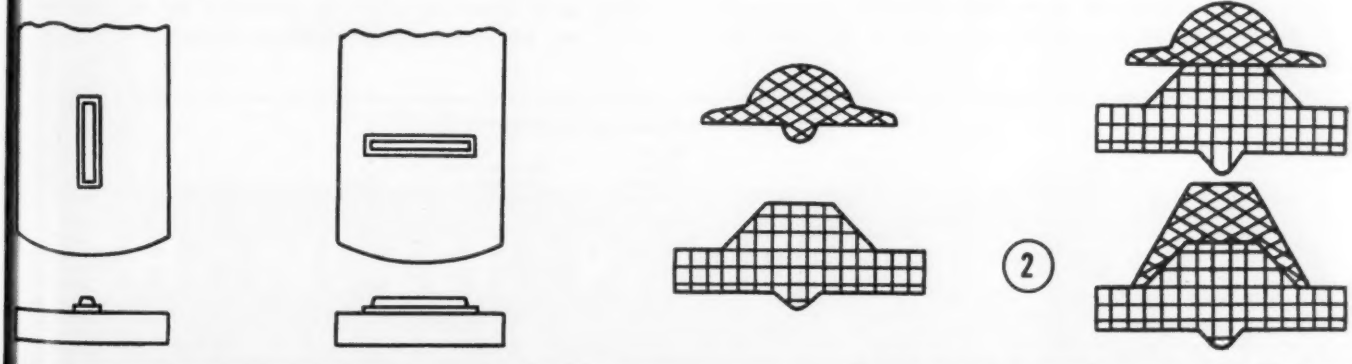
Data and illustrations courtesy Resistance Welding Institute, Cleveland.

Development of satisfactory procedures for resistance welding of dissimilar metal combinations obviously involves the determination of proper settings for current, pressure and time. In addition, the following conditions need to be investigated: 1. To what extent the metals differ in electrical conductivity; 2. difference in melting points of the metals to be joined; 3. whether the alloy produced by fusing the different metals will be tough and ductile or weak and brittle and in the latter case, whether ductility can be restored by automatic (in-the-welder) tempering; 4. the possibility of corrosion in the joint due to electrolytic action; 5. differences in plastic range; 6. differences in thickness of parts. No hard and fast rules can be laid down for setting up welding procedures under such conditions, but the factors affecting each job must be studied as a whole.

A practical approach to any individual problem is to consider the weld as fundamentally a metallurgical process. The first step toward the solution is to secure a balanced heating effect. This should preferably be done before the design of each of the component parts is definitely fixed. There may be other important factors than heat balance to consider. Therefore it is not usually economical to go into production on component parts until it has been proved definitely that the design of each part is sound from a welding standpoint. Another necessary preliminary is to assure the reproducibility of satisfactory procedures by providing the welder with the greatest possible degree of precise and automatic control.

Dissimilar Electrodes Used—Recommended method of obtaining heat balance when spot welding combinations which differ widely in heat and electrical conductivity is the use of two dissimilar electrodes, such as one of copper-alloy and one of a copper-tungsten alloy of high tungsten content. Combinations like copper with galvanized iron or copper with nichrome (metals of widely different electrical and heat conductivities) may be welded by using a copper-alloy electrode next to the nichrome and an electrode of an alloy rich in tungsten content adjacent to the copper.

This will give a balanced heating effect, the low resistance copper electrode in contact with the high-resistance nichrome helping to conduct away the excessive heat caused by the high resistance of the nichrome, while the heat in the low-resistance copper-alloy of the part being welded is intensified and



APPLICATIONS

Resistance Welding Dissimilar Metals

Incandescent Lamps: Lead-in wires consisting of a piece of copper, a piece of Dumet and a piece of nickel.

Radio and Vacuum Tubes: Combinations such as molybdenum to nickel, Fernico to steel, molybdenum, tungsten and copper to nickel.

Control Parts: Phosphor bronze to steel, copper, silver, nickel, Nichrome and others, copper to brass and combinations of the above.

Telephone Instrument Parts: Precious metal disk, bar and point contacts to springs, seam welding bimetal bars for contacts, bronze and nickel-silver, magnet steel to low carbon steel.

Electrical Instruments and Appliances: Welding of cable wires to many types of lugs and terminals.

localized by its contact with the relatively high-resistance copper-tungsten electrode. This causes the two dissimilar metals to heat evenly to the welding temperature.

A wide choice of electrode material is available, ranging from pure copper of high conductivity through the copper-tungsten alloy series to pure tungsten which has a still higher resistance. Pure tungsten is seldom used except in cases where two pieces of metal of very high heat conductivity are to be welded. If the conductivities of the component parts are not widely different, a satisfactory heat balance may usually be obtained by using the same type of electrodes on both sides of the joint.

Typical Procedures—A Monel-backed silver contact is projection welded to a flat brass or other metal spring or bar, such as tinned or plated brass, phosphor bronze, steel or copper, on a bench type press welder. There is a dome-shaped projection on the Monel side of the contact. Dial feed mechanism carries the springs and bars to welding position. Contacts are positioned by automatic feed.

In butt welding a copper rod to an aluminum rod, the aluminum, with a lower melting point and lower conductivity than copper, is clamped in the welder with $\frac{3}{8}$-inch protruding from the dies and the copper with $\frac{7}{8}$-inch protruding. The weld is started with relatively low pressures until proper temperature is reached, then a relatively high pressure is used to push up the weld and extrude all or nearly all of the copper-aluminum alloy from the joint. It is important to get rid of this alloy because of its brittleness. If high pressure is used at the start of the weld the aluminum upsets before a sufficiently high temperature is reached to complete the weld. If the lower pressure is used throughout the operation a thick layer of alloy is formed and the joint is brittle.

Average contact dimensions for a precious metal points which, with disks, are welded to flat springs, are about 0.030-inch high and 0.030-inch in diameter base. The usual disk dimensions are 0.005-inch in thickness and approximately 0.090-inch in diameter. The machine for welding point contacts uses the contact metal in the form of wire which is fed to the point of the weld by means of a chucking arrangement. The end of the wire is projection welded to the contact spring which has been carried into position on a fixture having a reciprocating motion.

After the weld is made, a wire is clipped, leaving a predetermined length attached to the spring. The spring is moved forward to another position where the contact is formed to final shape with a hammering tool. Somewhat similar devices are employed in welding disk and bar contacts. Fig. 1 illustrates four types of disk and point contacts, the former being usually spot welded, and the latter projection welded. Fig. 2 shows how bimetal bar contacts are made by seam welding and subsequently joined to springs by projection welding.

Although there are no data available on which to set up recommended procedures, the welding conditions shown in the accompanying table are offered as being of possible interest and as a guide for spot welding under comparable conditions.

Refractory Metals—The metals tungsten, molybdenum and tantalum are usually classified as refractory metals because they are all characterized by having extremely high melting points, the melting point of tungsten being 3380° C, of molybdenum 2620° C, and of tantalum 2850° C.

In resistance welding, the metals are joined together by providing heat generated by the passage of a high electrical current; with the application of pressure, a weld is formed between the two materials to be welded. In certain metals actual fusion at the interfaces is necessary to produce a substantial weld, while in other metals welding may be due to a recrystallization process taking place below the melting point of the metal. There is reason to believe that in the case of the high melting point materials, tungsten, molybdenum and tantalum, welding is produced by a recrystallization between the metals.

Due to the high melting point of the refractory metals, they are prepared by means of powder metallurgy and their ductility is provided by a fibrous structure which has to be retained during welding in

DISSIMILAR METALS—WELDING CONDITIONS

Top Sheet Material	Top Sheet Thickness, Inches	Bottom Sheet Material	Bottom Sheet Thickness, Inches	Electrode Tip Diameter, Inches	Time Cycles	Iva. Input	Pressure, Pounds
Bras	0.050	Silicon Bronze	0.050	¼	4	57	450
Brass	0.62	Silicon Bronze	0.062	¼	4	63	500
Brass	0.050	Nickel Silver	0.0325	¼	3	57	450
Brass	0.050	Stainless Steel	0.032	¼	2	18	550
Brass	0.050	Galvanized Iron	0.035	¼	4	67	500
Silicon Bronze	0.050	Low Carbon Steel	0.050	¼	2	32	470
Nickel Silver	0.032	Stainless Steel	0.032	¼	2	7	450
Galvanized Iron	0.035	Low Carbon Steel	0.040	¼	3	13	400
Galvanized Iron	0.018	Stainless Steel	0.032	¼	2	31	550
Low Carbon Steel	0.040	Stainless Steel	0.032	¼	2	13	550

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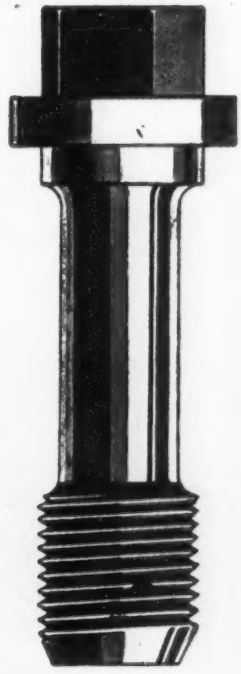

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order to provide a certain amount of ductility combined with high strength in the weld area. For this reason, it is necessary that the materials be welded with the shortest possible current duration period or current timing.

Conventional alternating current spot welding has been found suitable in many cases for welding the refractory metals and is particularly recommended if the current duration period is accurately controlled by means of a synchronous electronic tube control. Satisfactory results have been obtained in both spot and seam welding of tantalum, and both tungsten and molybdenum have been spot welded on alternating current welders without encountering excessive recrystallization if the proper welding conditions are used.

Problem of Oxidation—In order to reduce oxidation and to decrease electrode deterioration the refractory metals have been satisfactorily welded under certain liquids such as carbon tetrachloride and water. Oxidation may also be avoided by playing a stream of hydrogen on the parts being welded. It has been found that tantalum and molybdenum have slightly better resistance welding characteristics than tungsten with regard to brittleness in the weld area.

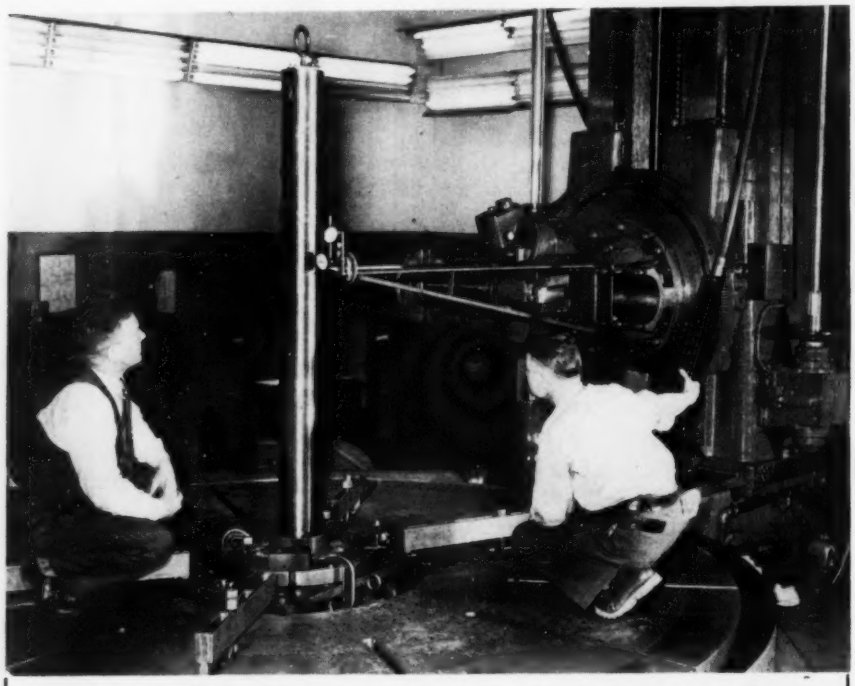
In many cases it is desirable to attach tungsten, molybdenum and tantalum to other materials, such as iron base alloys, copper base alloys or nickel alloys, by resistance welding. Refractory metals form alloys with iron, cobalt and nickel quite readily, while, on the other hand, it is difficult to form alloys of the refractory metals with copper or silver. However, it seems possible to obtain, by proper welding conditions, a wetting of the refractory metals with copper or copper base alloys and thereby producing a satisfactory although incomplete weld. In welding refractory metals to iron and nickel alloys directly, usually these lower melting point materials fuse at the weld interface, thereby wetting the refractory materials and forming small surface alloy layers.

In many cases in welding the refractory metals to each other, it has been found desirable to interpose beween the two metals a third metal, such as nickel or nickel alloy, or similar materials which alloy readily with both refractory metals to be joined together. It has been found possible also to use straight butt welding for attaching refractory metals to base metals, such as iron and nickel base alloys.

Set Up Test Cleaning Service

COMPANIES wishing to test a new cleaning method or material may do so under actual working conditions, using the facilities available from Magnus Chemical Co. Inc., Garwood, N. J. A wide variety of cleaning equipment and chemicals are available in a special building provided for the purpose.

Building is equipped with four mechanically agitated cleaning machines featuring three different types of agitation. In addition, there is a turntable type spraying and rinsing machine. Two different types of cleaning tanks also have been installed, along with a drying oven, deburring and burnishing barrels, a steam gun and solvent cleaner sprayer. With this equipment, the company states that it is possible to determine not only the best chemicals, equipment and method for achieving a desired cleaning result, but actual cleaning times and costs can be accurately recorded as well.



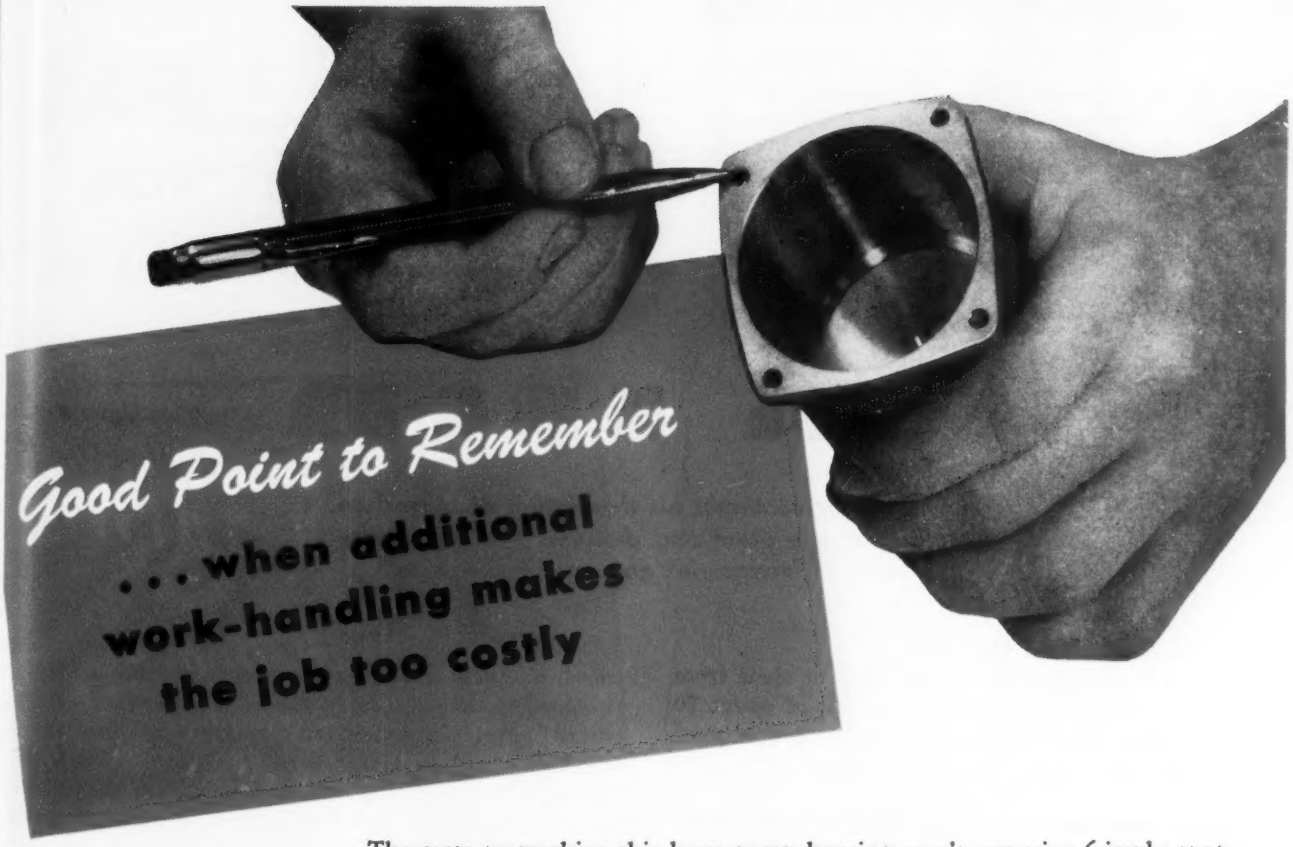
ZERO TOLERANCE: This testing shaft, called a "pig", is set perpendicular to the table of a 160-inch gear hobber with a 0.0000-inch tolerance at both ends. Photo shows a periodic test being made in the Sunnyvale, Calif., plant of Westinghouse Electric Corp. to make certain that the machine's stanchions are square to the table in both directions. In order to pass the test, the stanchion must be parallel to the "pig" within 0.0002-inch on both dials for the entire length of the testing shaft

Bearing Babbitt Described

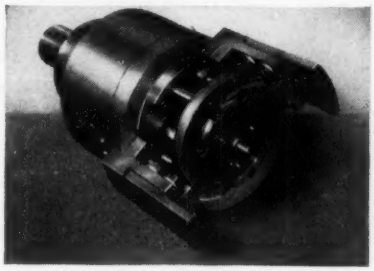
HEAVY duty babbitt for sleeve bearings subject to combined weight, heat and shock is described in a leaflet issued by Magnolia Metal Co., Elizabeth, N. J. The D-Z-L babbitt is for application on connecting rods and main bearings for diesel engines, large compressors and for pitman or eccentric bearings of trap rock crushers.

Analyzing Plating Solutions

PRINCIPLES involved in the analysis of plating solutions, the use of apparatus, the methods of sampling a solution and the methods of analyzing for all of the important constituents in solutions for plating a wide variety of metals are included in a divided bulletin offered by Hanson-Van Winkle-Munning Co., Matawan, New Jersey. Entitled, "Simple Methods for Analyzing Plating Solutions," the booklet has an appendix which covers the determination of rochelle salt in a cyanide copper plating solution.



The costs to machine this brass pump housing aren't excessive (simply spot drilling, boring, facing, chamfering) — until it comes to drilling the 4 holes in the flanges. There's the rub: *extra* handling . . . and *extra* costs. P&J Tooling on the P&J Automatic solves the cost problem with tungsten carbide tooling, and . . .



THE P&J-DESIGNED SELF DRIVEN MULTIPLE SPINDLE DRILLING ATTACHMENT which is automatically indexed into exact alignment — to drill and c'sink the 4 holes in one operation while the work spindle revolves. Machining time is reduced . . . unnecessary work-handling eliminated. Good points to remember!

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By B. M. STUBBLEFIELD
Manager, Chicago District
Youngstown Sheet and Tube Co.
East Chicago, Ind.

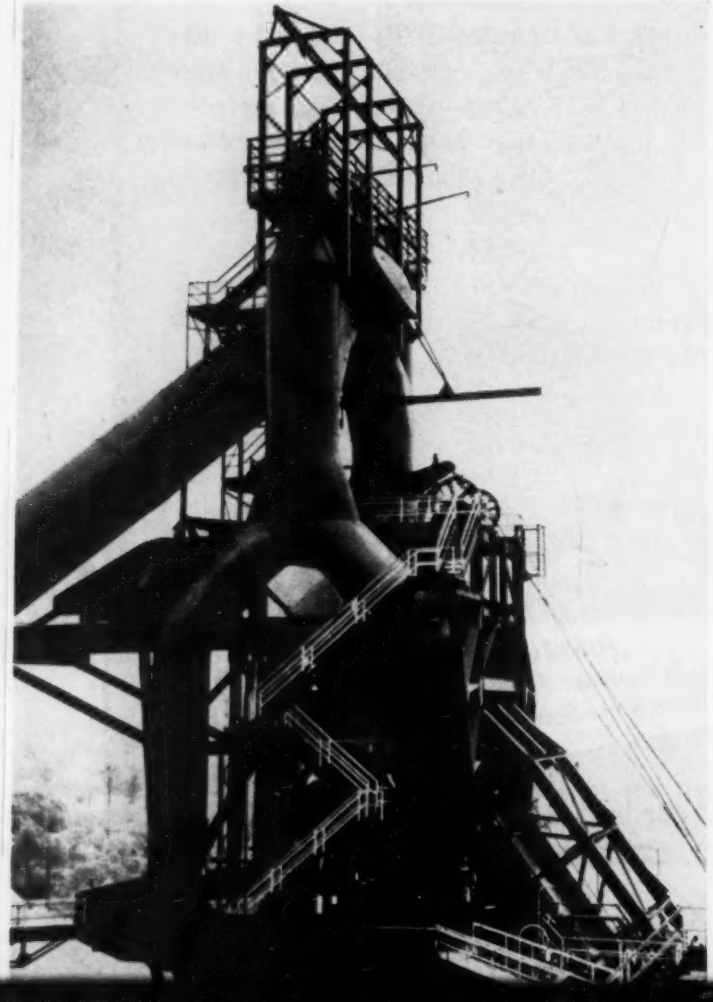
Production of PIG IRON

The author continues his description of a modern blast furnace plant and discusses the importance of correct refractories and auxiliary equipment

PART III

THE STACK includes the entire furnace shell from bosh to top and is a tall truncated cone of about 70 feet in height. The outer jacket is composed of steel plates. In some cases, the same thickness of a 1 to 1¼-inch plate is used throughout. In other instances, thick plates are used at the top and bottom and thinner plates around ⅝-inch thick through the middle section. Either riveted or welded construction may be used, and it is generally thought that, irrespective of method employed, the residual stresses are of the same order. In American practice a medium lining thickness of 3 to 4 feet is most common. With this lining, water cooling plates are sometimes used in the lower portions of the stack where higher temperatures exist. A small space is normally left between the lining and shell to allow for expansion and this area is usually filled with crushed slag or loam. Directly above the bosh, the stack is a straight cylinder for 10 to 15 feet after which it tapers in slowly. The top 8 to 10 feet at the stockline are again straight vertical walls.

Fig. 12—Top of furnace showing, skip bridge on right and downcomers, various furnace top platforms and bleeder platforms



The furnace top, which was open with exhaust gases burning in the atmosphere until about 50 years ago, now provides the means of piping the ascending gas, and mechanism for charging solid raw materials. The top now consists of a double bell and hopper system with a gas tight chamber between. Both bells are castings, occasionally hard faced, particularly at the outer portions, for increased resistance to abrasion The small bell, about 6 feet in diameter and with slope of about 50 degrees has a capacity slightly larger than one skip car. The large bell, which is the lower of the two, is of the same design as the small bell but has five to eight times as great a capacity.

The small bell is a part of the revolving distributor which, as its name implies, serves to distribute evenly the various materials as they are charged into the furnace. After receiving a skip car load, the small bell opens to deposit the load on the large bell, which in turn opens after a complete round of skip cars loads have been received. Many factors such as the ratio of area of the large bell to the stock line area and rate and amount of travel of the large bell are important considerations in stock distribution. These factors will be covered later when actual furnace charging is described.

Offtakes for ascending gases come off the top of the stack just below the large bell. These offtakes or

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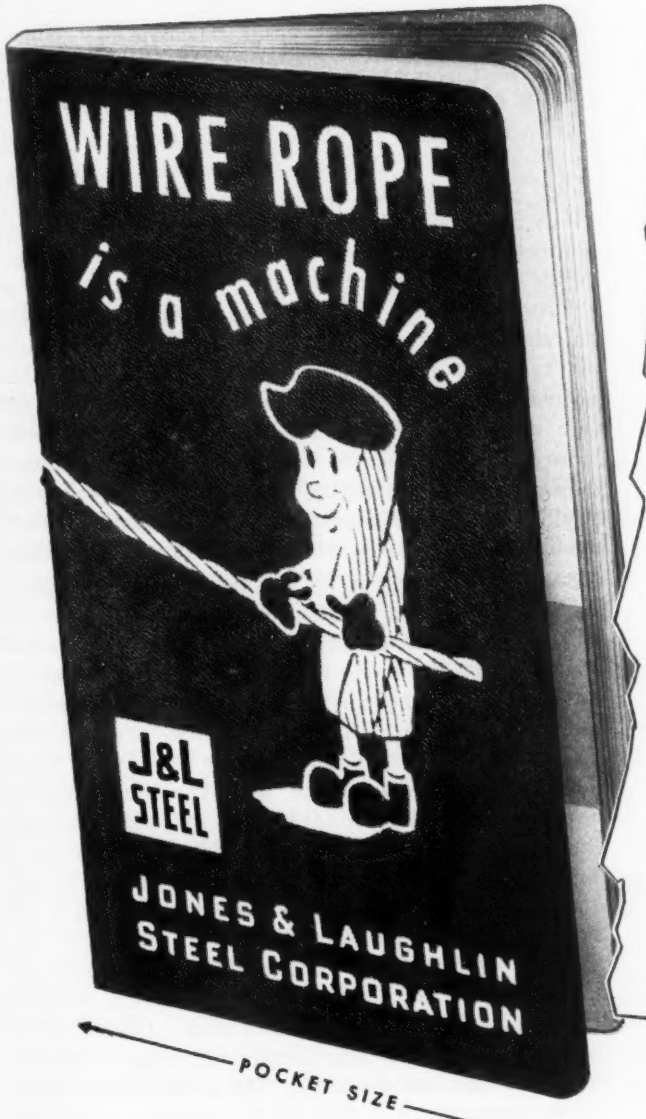

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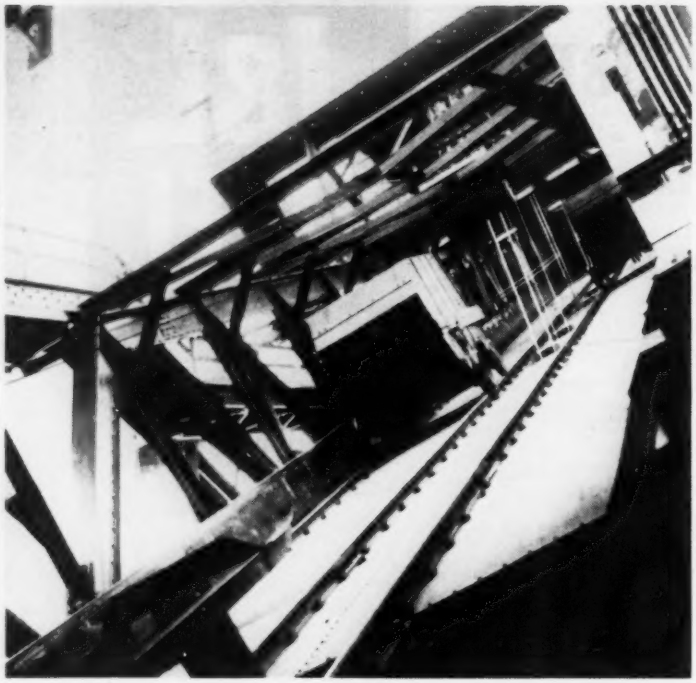

Fig. 13—View taken up skip bridge showing skip car

risers which are generally four in number must be equally spaced and equal in resistance to gas flow to avoid any irregular gas flow in the furnace stack and resultant channeling. As large an offtake area as possible is desired to decrease gas speed and to hold down the amount of flue dust. Normally, temperature of the top gases is low enough to permit use of steel pipe without a refractory lining. In addition to temperature, the gas velocity and dust content affect the type of lining used. If a refractory lining is required, steel wearing plates are used at corners. If a refractory lining is not necessary, steel wearing plates are used throughout, and a larger effective area is obtained for the same diameter pipe. The

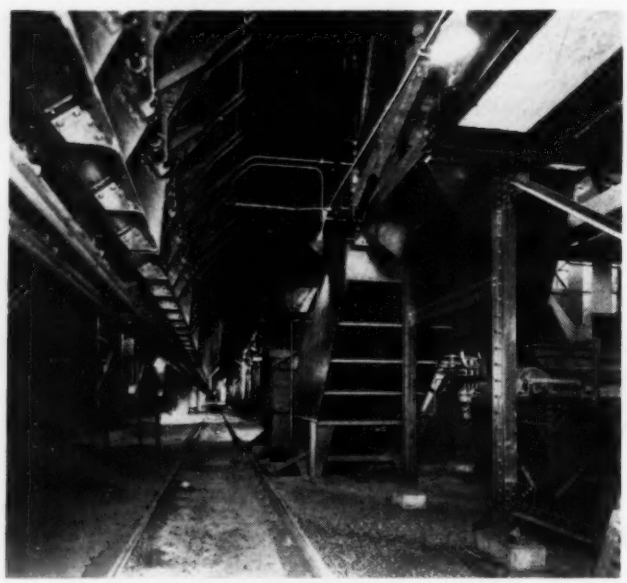

Fig. 14—Stock house contains all raw materials. Seen in photo are bin bottoms, scale car track and coke and coke breeze handling equipment at right

area of the offtakes which is about one third of the stockline area, is usually designed to hold gas velocity at a maximum of 30 feet per second at maximum wind volume. The offtakes run into one or two downcomers, which deliver gas to the cleaners. Downcomer area is about one quarter of the stockline area.

Other top openings include relief valves which are counterbalanced to open at a certain pressure to avoid any undue build-up of internal pressure. There are also openings for steel rods which act as stock level indicators and automatically record stock height in the furnace, and transmit a continuous record to the cast house.

It is essential that blast furnace refractories be of the best possible quality available. Furnace life depends to a very large extent upon lining life. Thus it is economical to purchase the highest quality brick to increase life and total tonnage and to avoid relining costs as long as possible. These refractory bricks must be of high quality not only with respect to refractory properties, but also with respect to accuracy and uniformity of size, density or lack of porosity, strength, resistance to corrosion, abrasion and shock. Different grades of brick made of various types of refractory mixtures are used for the various furnace locations. Each type of brick has been specifically designed for its particular purpose. In any case, they should be manufactured from finely ground material, machine pressed and hard burned at a temperature higher than it will be exposed to in the blast furnace to prevent any secondary shrinkage.

Bottom bricks must be strong enough to support the burden weight, highly refractory since they are exposed to high temperatures, dense enough to resist corrosive action of the molten iron, and accurate in all physical dimensions to make a solid mass with a minimum of slurry. All bottom bricks are of a fairly large size to reduce the number of joints. These bricks are laid end to end with the long direction vertical to a minimum of 13 feet in total thickness. Care is taken in laying to avoid continuous joints throughout all courses, although opinions vary as to whether this discontinuity is most beneficial in a vertical or horizontal plane.

Bricks used in both the hearth and bosh are subjected mainly to the highest temperatures, and the scouring action of the iron and slag. Consequently, the two most important factors are high refractory properties and low porosity. Thickness of the hearth lining varies from 5 feet at the bottom to about 3 feet at the top. Bosh thickness is generally around 2½ feet. A number of new furnace linings have used large carbon blocks for the hearth. To date insufficient experience has been obtained to report definitely on the desirability of this material.

In the furnace stack, temperature resistance is the main consideration in the lower portion, and resistance to abrasion and shock from the raw materials entering the furnace top is the most important factor in the top portion near the stockline. Therefore, brick for the stockline section must be dense, tough and of high mechanical strength to withstand shock and abrasion. Lining thickness is approximately 3 feet. In addition to the refractory lining, steel wear-

ing plates are generally used to increase resistance to abrasion and shock at the stockline.

In both offtakes and downcomers, the brick is subjected to abrasion from solid materials carried in the gas, and high temperature is not too much of a factor.

With respect to blast furnace cooling, it may generally be said that the lowest amount that can be used and still afford adequate protection to the brick works is most desirable. In American practice it is customary to cool most of the regions subjected to high temperatures.

In the hearth, cast iron plates with hairpin pipes cast in them are used for cooling. These plates are located between the lining and the steel jacket. In both the upper hearth portion and bosh, copper cooling plates are embedded in the courses of brick. Number of these cooling plates is the greatest in the immediate vicinity of the tuyeres and decreases as the distance from the tuyeres increases. In the bosh area, these thin flat plates extend completely through the lining.

In the lower 20 to 25 feet of the stack, flat copper water cooled plates may be used for cooling. These plates are generally built into the brickwork in the same fashion as in the bosh and are placed in staggered rows about 3 feet apart both horizontally and vertically.

Amount of water required for cooling purposes for the entire furnace is in the order of 3 to 4 million gallons daily.

With a view towards low freight costs, water transportation is normally employed for ore shipments whenever possible. With respect to the Great Lakes area this has led to the development of the specialized ore boats frequently referred to as self-propelled barges which were designed specifically for the handling of this bulk cargo. Newest of these ore boats has a capacity of as large as 20,000 tons. They are unloaded either by unloaders, designed for this sole purpose, or by large traveling cranes called ore bridges, used in ore storage yards. Speed of unloading is very essential in order that the maximum number of trips may be made during the shipping season, which on the lakes averages about seven months yearly, and it is not unusual to unload a 12,000-ton ore cargo in less than 8 hours. For railroad shipments, car dumpers, which can handle a standard railroad hopper car, dumps them at the rate of 20 per hour.

Except in plants where space is restricted, a large ore storage yard is always found in connection with blast furnace installations. In most cases, additional storage space is provided for stone. Primary purpose of storage yards is to furnish a sustained supply of ore irrespective of mine difficulties or shipments. In the Great Lakes region, where no ore is shipped during the winter months, stock piles of as high as 500,000 tons per furnace may be carried. This ore yard should be of such dimensions as to provide sufficient space for separate piles for different grades of ore. A second, but by no means unimportant, use of these storage yards is that of ore selection and blending. This is not normally done in the Great Lakes region where ore is classified and blended at the upper lakes ports before shipment. Large crane structures, called

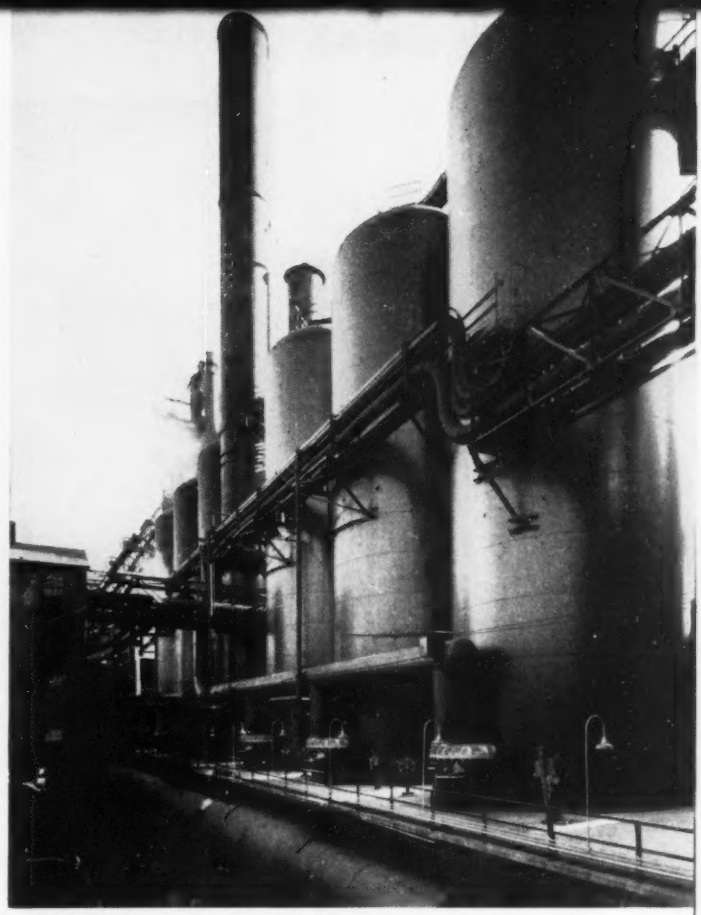

Fig. 15—View of blast furnace stoves and operating platform

ore bridges, are used for moving ore through the storage yard. These cranes span the entire yard width and can travel its total length. One scoop of the bucket can readily hold 15 or more tons of ore.

From the storage yard, ore is carried by the ore bridge to the transfer car, which is a hopper car operated on an elevated track, called the "high line." In addition, the "high line" generally provides facilities for coke delivery either by a second transfer car or belt conveyor and for miscellaneous materials by standard railroad hopper cars.

This "high line" runs over the stock house which provides storage bins holding an immediate supply, approximately sufficient for one day's operation, of all

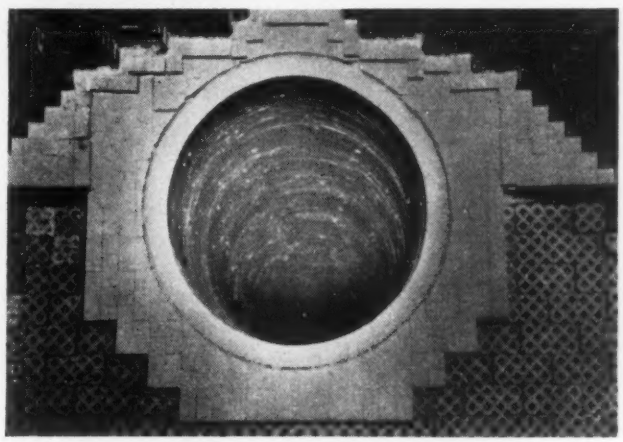

Fig. 16—Looking down into top of stove checker work and combustion chamber

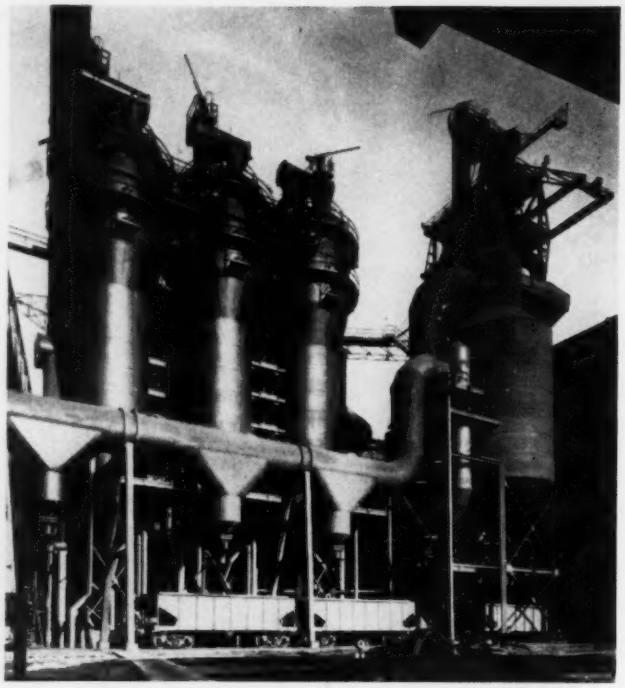

Fig. 17—Blast furnace gas cleaning system showing, dust catcher at right and three superimposed precipitators in center

solid raw materials. On the ore side, there may be as many as 12 bins, having for a modern large furnace a capacity of around 250 tons of ore per bin. Generally two or three of the bins on the ore side are used for limestone. On the coke side, there is a central coke bin which is about twice the size of an ore bin and a number of smaller bins for miscellaneous materials. Individual bins have vertical sides and a hopper bottom. No reinforcing members or other obstructions to free flow are permitted on interior surfaces. The bottom angle for coke is around 45 degrees. However, because of a tendency of the clay-like ore to stick, a steeper angle is used in ore bins. Hopper bottoms of the bins may be operated either manually or mechanically.

In the stock house bottom, which is usually below ground level, is located a scale car which transports raw materials from the bin to the skip hoist. This car consists of two hopper compartments, each of which have the same volume capacity as one skip car. An operator rides the scale car which automatically weighs and records the weight. The scale car performs a very important function in the charging of the furnace and is subject to hard usage from shock in loading, rapid acceleration and deceleration. All solid raw materials are carried in the scale car except coke which generally feeds from the bin into a weigh hopper and then directly to the skip car.

Modern skip cars have a capacity of about 250 cubic feet which is equivalent to 7500 pounds of coke and 30,000 pounds of ore. Each furnace has two skip cars which travel from a pit below the stock house to the furnace top on rails supported by a steel structure called the skip bridge. One car travels up while the other travels down. Skip cars up-end and dump their load in the upper rotating hopper onto the small bell.

The entire system of charging equipment, consisting of the stock house, scale car, skip hoist, the small bell with the distributor and the large bell, is a closely inter-related chain in which each unit must function properly or the entire system fails. Each piece of equipment must be designed in all respect to fit into the desired cycle for filling the furnace, and all operations must be timed to co-ordinate with each other. Importance of this co-ordination can be illustrated by considering that a furnace producing 1440 tons of iron per day will require approximately 700 skip car loads or one every other minute. This means that once every 2 minutes the small bell rotates through an angle which is some multiple of 60 degrees and opens to deposit the skip car load on the large bell. In addition, the skip car must be filled, travel some 200 feet and dump its load. Since this is an impractical schedule for the scale car to maintain, the coke, and, in some new furnaces, limestone bins are located directly over the skip hoist pit so that these materials can by-pass the scale car and be charged through weigh hoppers into the skip car.

Importance of the blowing equipment is readily realized by the fact that the amount of air, both with respect to volume and weight, is greater than the sum of all other raw materials. Formerly, direct action piston-type pumps were used to create the blast. Practically all modern installations use a multi-stage centrifugal compressor of variable speed driven by a steam turbine, because centrifugal blowers maintain a relatively constant pressure volume ratio. Normally a constant volume regulator actuated by a venturi tube maintains a steady blast volume regardless of such factors as blast pressure, steam pressure or temperature. Blowers are designed to deliver the blast at a pressure of up to 40 pounds. Actually the blast is normally applied at a pressure of from 15 to 30 pounds. Two or three pounds are lost between the blowers and tuyeres. An additional pound or two is lost at the tuyeres. The balance is lost in the stack. Top gas pressure is generally 1 to 1½ psi.

Originally the blast for the furnace was heated on the recuperative principle, but, at present, it is nearly universal practice to preheat blast furnace air in regenerative stoves. These stoves are vertical, cylindrical, refractory lined steel vessels with a dome top. They vary in size up to a present maximum of 30 feet in diameter and 125 feet in height. Each stove consists of a combustion chamber and a checkerwork chamber. Although the combustion chamber is occasionally in the center, it is usually elliptical in shape and located at one side extending from top to bottom. Controlled volumes of gas and air are admitted to the combustion chamber which heats the stove to temperatures in the neighborhood of 1900 to 2300°F.

The regenerative chamber is filled with a checkerwork of refractory brick. Originally straight brick shapes were employed, but now special shapes are used. As cleaner blast furnace gas has become available, smaller checker openings and thinner checker work bricks have come into common usage, both factors tending to increase the efficiency of heat transfer and to reduce stove size. Checker openings which run from top to bottom, are now generally about 2 inches in diameter, and the brick is about 1½ inches thick.

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Two factors governing stove efficiency and capacity are the amount of brick surface and the brick volume or mass. Stove capacity is directly related to the weight of brick heat-storing capacity. Actually only the mass of brick within ¾-inch of the surface is effective as heat storage. Consequently, brick of 1½-inch thickness is the optimum size for maximum effective heat storage capacity. Efficiency with respect to heat transfer is directly related to the surface area through which the heat can be transmitted to the cold blast.

Size of the stoves depends upon their ability to yield to the blast a sufficient amount of heat for a period of time, and number of stoves are based on the rate at which checkers may be reheated. Since heat transfer rates are as large if not larger during the gas period as in the blast period only two stoves are actually required for one furnace. However, because of the time interval required to shift from one stove to another, normal maintenance requirements and allowable safety factor in case of various operating difficulties, three stoves per furnace are the minimum number used. Some older furnaces use four or even five.

The checkerwork of brick is heated by the passage of hot gases from the combustion chamber as they descend through the checkerwork openings and out the bottom of the stove to the stack. After the stove has been heated sufficiently, the gas and stack valves are closed and cold and hot blast valves opened. The blast is then allowed into the stove where it flows countercurrent to the gas flow to pick up heat stored in the checkers. With modern stoves, it is possible to maintain a relatively constant blast temperature during the normal blast period of 90 minutes.

Blast temperatures range from 1000 to 1500° F with a tendency towards the high side of the range. Operating efficiency of the modern stove is in the neighborhood of 85 per cent, with stack and radiation losses accounting for the balance of the heat.

As gas leaves the furnace top, it carries a dust content of from 4 to 30 grains per cubic foot, with an average content of from 10 to 15 grains. This is roughly equivalent to 200 pounds of flue dust per ton of iron produced and is composed mainly of iron ore, coke and limestone. Actual particle size range in the gas varies tremendously from about ¼-inch to microscopic size in diameter.

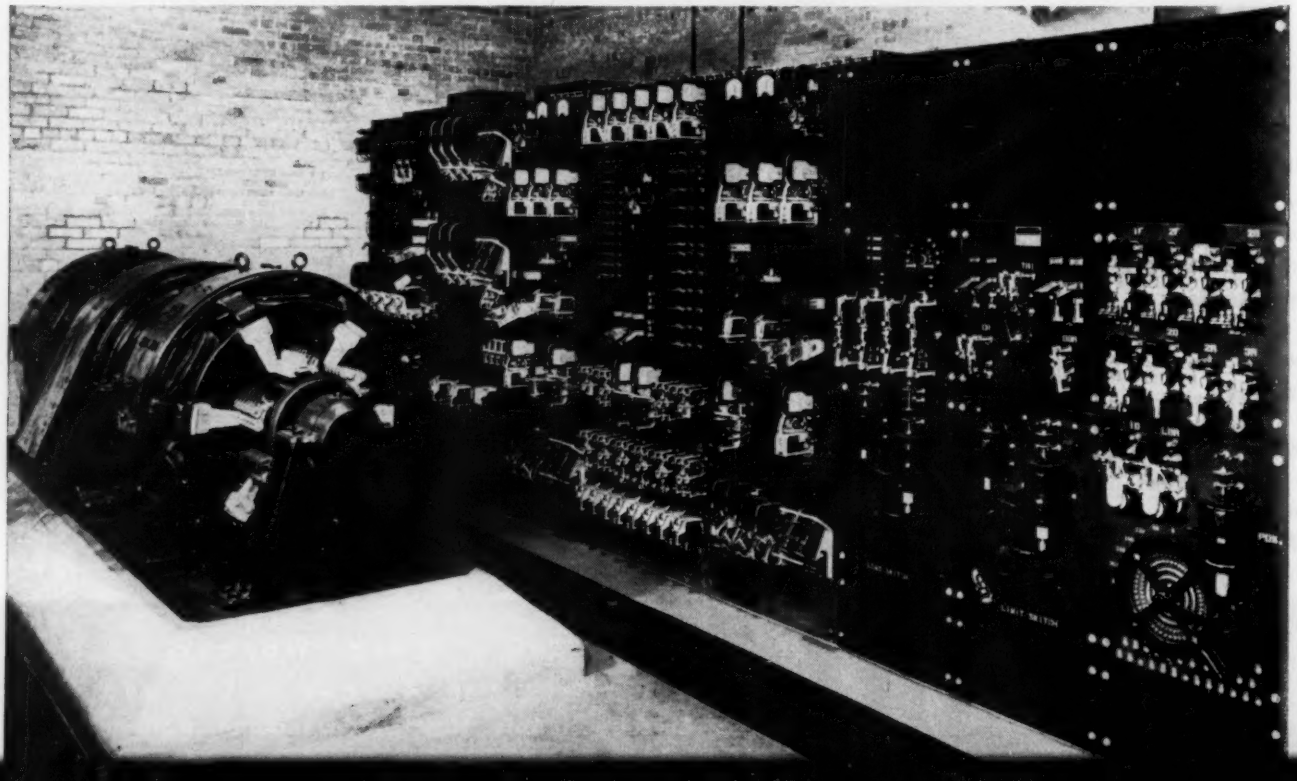
Removal of these dust particles is required to avoid fouling up gas mains and burning equipment, as well as to improve the gas' combustion. Most important use of the gas is directly in connection with the furnace operation itself in the hot blast stoves which burn from 20 to 25 per cent of the gas produced. For efficient stove operation, including high thermal efficiency and continuous dependable operation, blast furnace gas must be cleaned before use. Thus if no other reason existed, the furnace itself insists upon clean gas.

Amount of gas cleaning performed depends to a large extent upon its ultimate use. In gas engines, modern blast stoves, coke ovens and other furnaces with checkerwork heating chambers, a dust content of less than 0.01 grains per cubic foot is required. For ordinary boilers and furnaces, a higher dust content is permissible.

Both wet and dry methods may be used for cleaning. Although the dry method has the advantage of preserving the sensible heat, it is seldom used in this country. In either method, the cleaning process consists of two stages which are based on particle size. In the primary stage, larger particles are removed which leaves an approximate dust content of 0.06 to 0.2 grains per cubic foot. After the secondary stage, where fines are removed, the dust content may vary from 0.005 to 0.01 grains per cubic foot. In general, the smaller the particle size the more difficult it is to remove from the gas.

Irrespective of whether the wet or dry method is employed, the first step in removing dust is the

Fig. 18—View in hoist house showing, charging equipment control and motor-generator set at left



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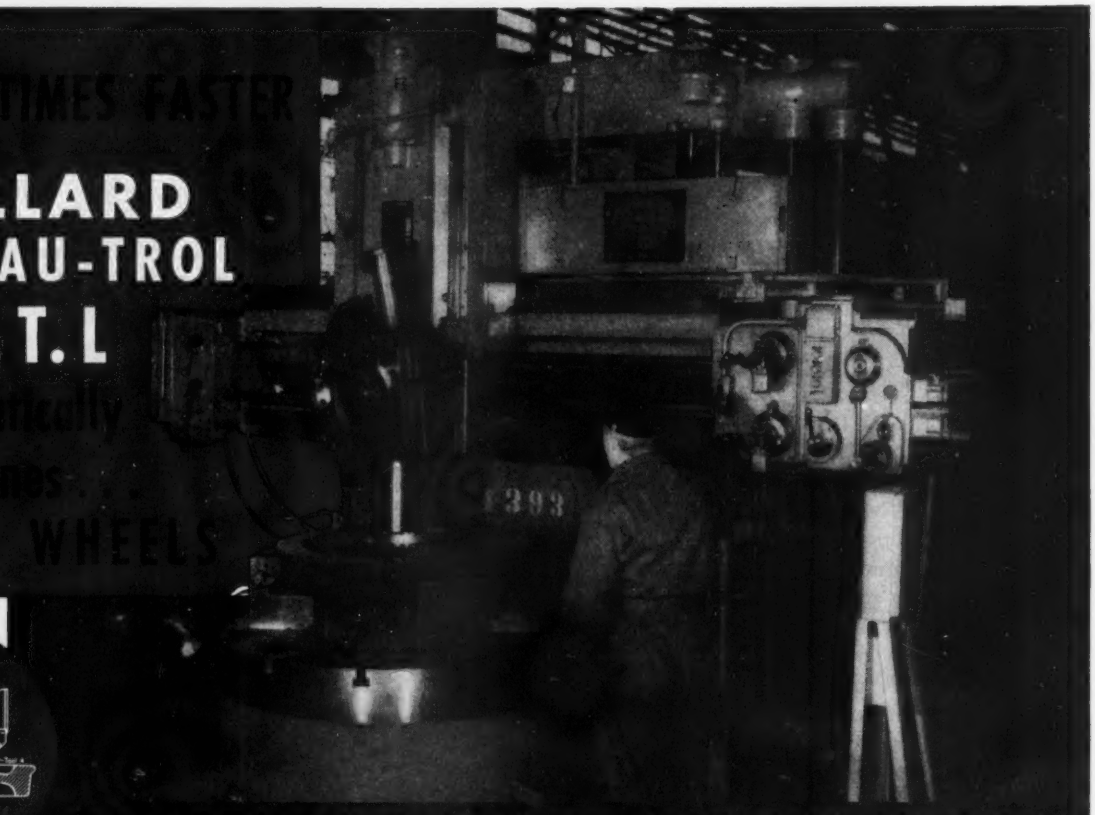

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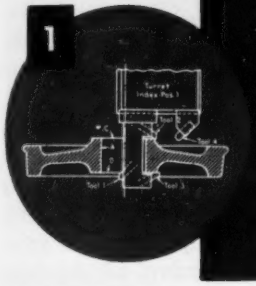

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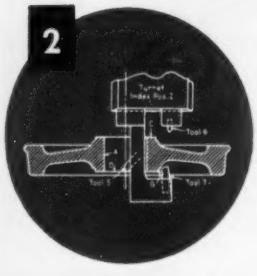
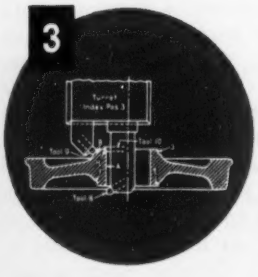


Proper tooling, proper sequence and automatic timing of operations, maintains accuracy and saves much time.

Turret Face #1

Rough bore — straddleface hub — rough form upper radius.

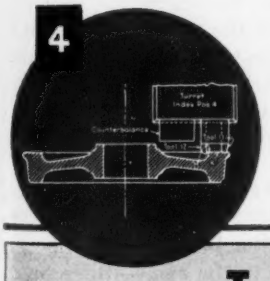
3



Turret Face #2

Semi-finish bore — finish face upper hub face — rough form lower radius — generate 20 degree angle — finish form lower radius — generate 45 degree angle and finish face underside of hub.

4



Turret Face #3

Finish bore and chamfer — finish form upper radius — finish hub diameter.

Turret Face #4

Face rim — cut wear groove.

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dust catcher, which is essentially a settling chamber. The dust catcher is fundamentally an enlargement of the gas main which operates on the principle of reducing the gas velocity and thus its dust carrying power. In addition, the gas also reverses its direction of flow. In design, it is just a large chamber in which the gas enters through a pipe at the top center which extends down into a chamber and leaves through a pipe taken off at one side of the top. At the bottom, there is a hopper arrangement to provide an accessible space for removal of the collected dust. Reduction in velocity is normally in the ratio of 5 to 1. On the average, the dust collector cleans the gas to about 3 grains per cubic foot.

If dust content of the gas from the dust catcher is too high for the primary cleaning stage, a whirler, which operates on the principle of centrifugal force is used. With a whirler, the dust content can be reduced to 2 grains per cubic foot.

In general, primary wet washers consist of cylindrical steel spray towers containing assorted hurdles, baffles and water sprays arranged in various combinations. These towers are designed to promote intimate contact of gas and water and to remove dust by the employment of water for washing it out. Large amounts of water, in the range of 25 gallons per 1000 cubic feet of gas, are required. Good efficient washers can clean gas to as low as 0.05 grains per cubic foot. However, average results are closer to 0.2 grains per cubic foot.

Because of the gas' high moisture content as it comes from the washer, some method of moisture removal is generally employed at this point in order to improve its combustion properties. Many various designs have been tried with varying degrees of success. Successful elimination of the moisture is doubly beneficial since it also increases efficiency of dust removal by the washer.

Two common types of secondary wet washers utilize rotary disintegration and electrical precipitation. With rotary disintegration a fine water spray is impelled from a rotating fan against horizontal bars. Irrespective of the incoming dust content up to about 3 grains per cubic foot, this device delivers a clean gas of from 0.005 to 0.020 grains per cubic foot.

The electrical precipitator is most generally used in the United States. It is based on the principle that suspended particles become charged in a high voltage field. The precipitator contains around 200 pipes of 8 to 12 inches in diameter. In the center of each pipe is a small rod carrying a high static charge. The dust particles become charged and are attracted to the pipe after which they are washed off by a thin film of water flowing constantly over the pipes. Capacity of a precipitator varies with the dust content of the incoming gas and its velocity.

A complete dry cleaning process is not commonly used in America. Various types of filters, electrical precipitators, or centrifugal whirlers are used in the primary stage. For the secondary stage, additional electrical precipitators or bag filters may be used. In the dry method, electrical precipitators are not as efficient as in the wet method. Bag filters are very good, being able to reduce the dust content from 2 to 0.002 grains per cubic foot, but they are very costly and require much cumbersome equipment. In addition, with bag filters a very close control of gas temperature must be exercised to avoid danger of fire.

In the United States, it is almost universal practice to use the dust catcher, wet washer and wet electrical precipitator.

(*To be continued*)

Rotary Gang Slitting

(*Continued from Page* 70)

fairly typical of conditions generally existing in fabricating shops. They demonstrate, first, the big potential output of relatively small standardized slitting lines and, secondly, the importance attached by management to the convenience of having their own slitting facilities.

In most such cases, where the slitting line is operated from 6 to 10 hours per week, its cost is usually justified strictly from the standpoint of direct savings, disregarding entirely the convenience. For example, a production of 40 tons per week for 52 weeks, amounts to 2000 tons per year. At a price for slitting service of ½-cent per pound, the total outlay per year would be in excess of $20,000 plus size extras, extra freight and handling.

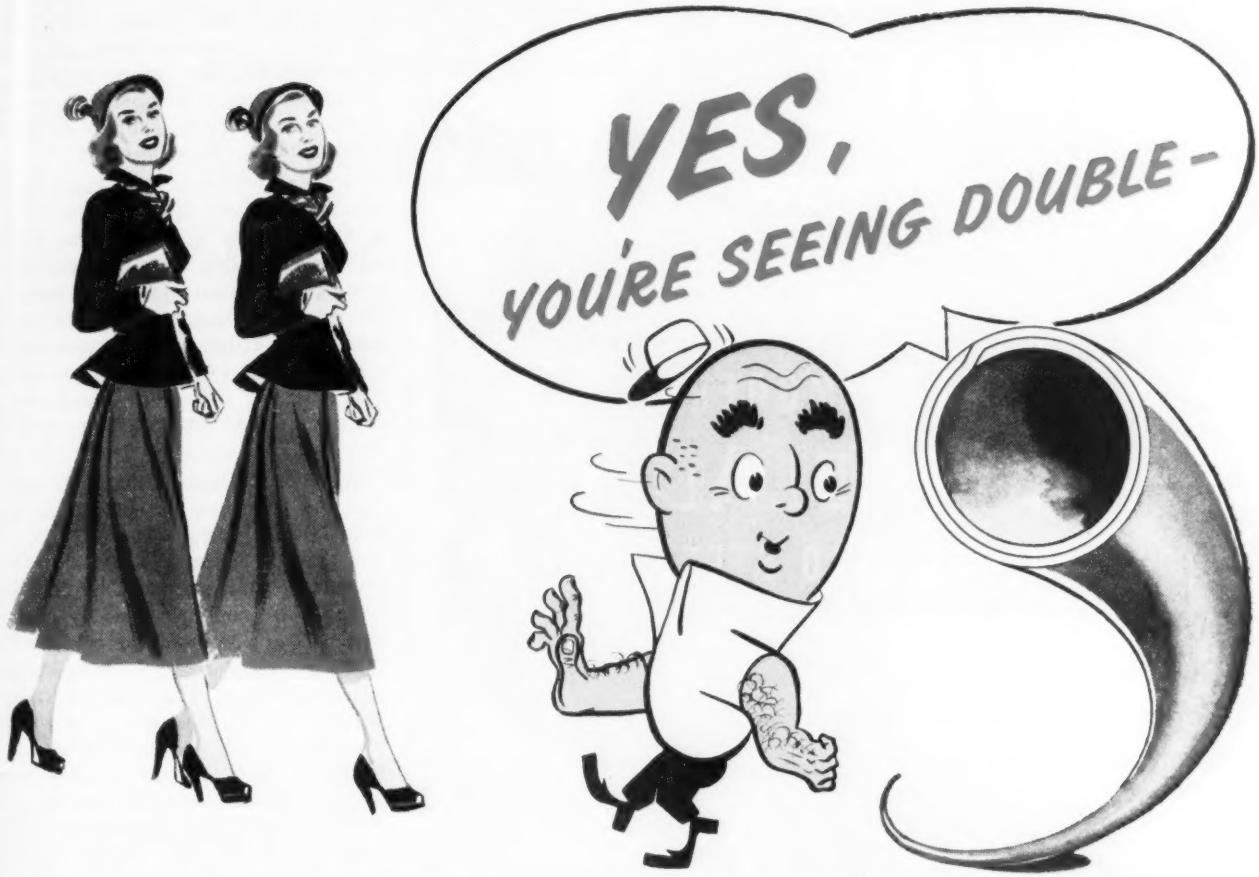
Loading and Unloading—Again referring to the breakdown of cycle time, the picking up of individual coils from storage with a crane, hoist or fork truck, loading and uncoiler, and the rebanding and removal of the same material after slitting, in most cases will require from 50 to 75 per cent of the total cycle time. During the operations, the crane or fork truck will be engaged elsewhere when needed, so that the slitter and crew sometimes may be kept waiting for several minutes. When therefore, these facilities are serving other purposes, much waiting time may be saved by keeping a small stock of coils close to the uncoiler and then have a chain hoist above, as shown in Fig. as this is always available when needed, and can be operated by the slitter crew.

The time of 5 minutes shown in the cycle breakdown on page for pickup and loading the uncoiler was so short only because, in this instance, a relatively light coil was handled and a nearby crane was always available. Also, the crew was skilled so that the coils were accurately placed on the uncoiler drum in the minimum of time.

Where these favorable conditions do not exist, this operation may easily take five or six minutes, or even more.

Coil Cars—To attain the maximum saving of time in placing coils on the uncoiler, hydraulically-operated coil cars are used. When such a coil car is provided, half a dozen or more coils can be kept in reserve on a small ramp. This can be so constructed that the foremost coil can be rolled onto the top or cradle of the coil car for instant reloading of the uncoiler. The cradle for loading purposes is kept flush with the floor, and is then raised to the proper height so that the coil on it will be ready to slide onto the uncoiler drum almost instantly when the end of the preceding coil leaves the uncoiler. All that has to be done is to reduce the drum diameter a trifle so as to be only slightly smaller than the core diameter of the coil. By this method, the uncoiler can be loaded in a few seconds instead of minutes, saving several minutes in the loading of each coil during the working day.

Next steps in the cycle—threading, attaching slit ends, and placing separators on the recoiler drum—are not susceptible of shortening by any means yet devised. The subject of



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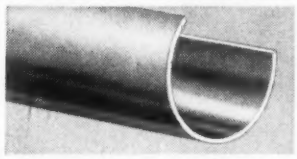

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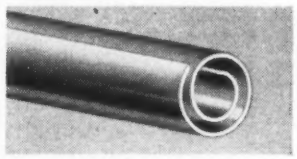
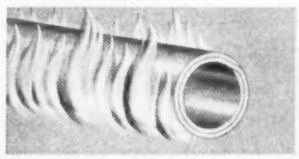


2 This strip is continuously rolled twice laterally into tubular form. Walls of uniform thickness and concentricity are assured by close-tolerance, cold-rolled strip.



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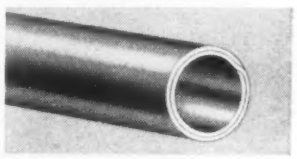

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slitting time has already been discussed. So there remains only the removal of the slit coil or coils from the recoiler drum, an operation which is the most time-consuming of all if several strands have been slit.

Even where only one band is to be placed around each coil one usually figures about 2 minutes for banding and removing each coil with separator, plus whatever extra time is needed for stopping the slitter, collapsing the drum, removing the spider clamp holding the coils in place, picking them up with fork truck, hoist or crane and getting them out of the way.

When a coil car is installed under the recoiler drum, its outward movement, loaded wtih slit coils, is accomplished by simply pushing the stripper plate against it. After unloading the coil car—usually onto a ramp—it is pushed back manually when needed for the next unloading of the recoiler. There are no delays waiting for a fork truck or crane; no time is lost in proper positioning of these facilities and no time consumed in initial banding, as the coils with separators can usually be loaded directly on to the cradle without loss of tightness or objectionable unwrapping at ends.

With coils handled by a crane on and off the slitting line, if the operator should ever fail to get his signals right, or if he should make some other mistake, the lifting power of the crane may be applied directly against the equipment so that the latter may be torn off its foundations, and the drums and shaft bent or broken. With a coil car such accidents are precluded, first because the lifting capacity of the equipment is sufficient only for the maximum coils handled and secondly, because control of elevation is much simpler and entirely in the hands of the operator standing right beside the equipment.

Several other special devices have been, and are, used for loading and unloading purposes, such as double-end swivel uncoilers and recoilers and three-arm manually operated unloaders.

(To be continued)

Polishing Machine Bulletin

AVAILABLE from Buehler Ltd., Chicago, is a bulletin on AB polishing machines for use in the metallurgical laboratory. Machines described are equipped with a double round motor supplying two polishing speeds. They are available with single or multiple tables, for table-top mounting or with flanges for countersinking into present equipment.

Effective Use of Materials Made in Chrysler's

SELF-ENERGIZING DISK BRAKE

Major advance in automotive brake design utilizes two 12-inch cast aluminum pressure plates in form of annular rings inside a cast iron brake housing

By A. H. ALLEN
Detroit Editor, STEEL

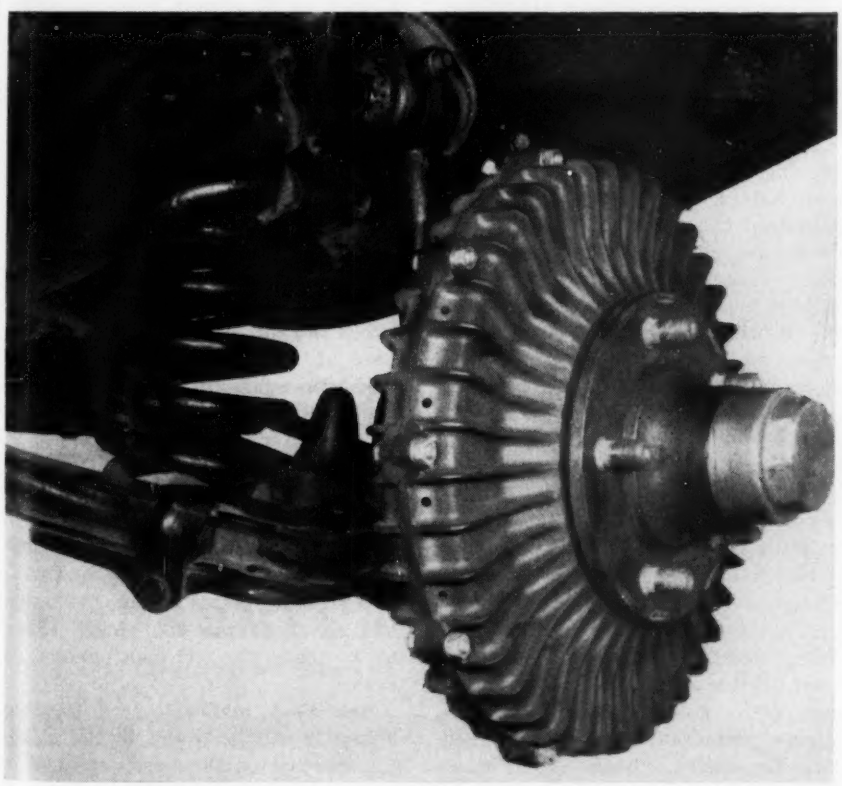
OVER the past 25 years since the introduction of the hydraulic automotive braking system the trend to heavier, faster cars has multiplied the braking effort required to stop a vehicle safely. Provision of adequate braking has been made even more difficult by concurrent trends to smaller diameter wheels and the necessarily smaller brake drums, with less braking area. Originally, brakes were large with respect to car weight and maximum speed. For example, a 15-inch diameter brake drum would be used on a car weighing 3500 pounds and having maximum speed of 60 mph. Today, the commonly used 15-inch wheel limits the brake drum size to 12-inch diameter and yet it must stop a car weighing as much as 4500-5000 pounds with maximum speed of 100 mph.

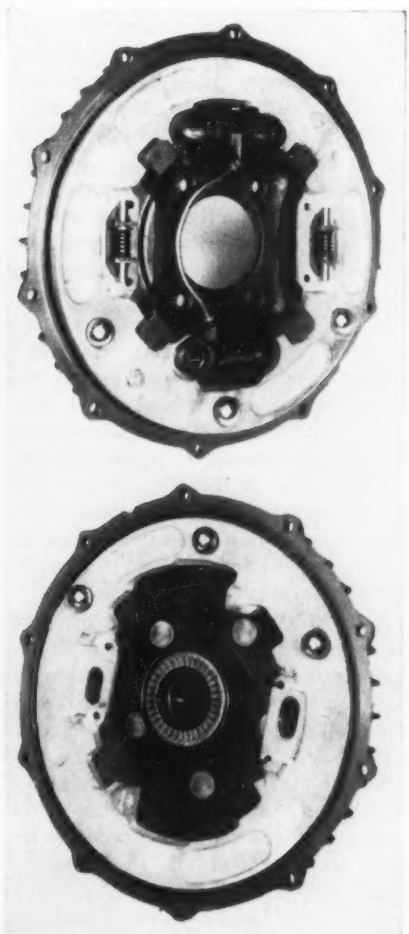
With heavier cars moving at higher speeds, brakes obviously must be capable of absorbing much more energy, since basically the automotive brake is a device which converts mechanical energy into heat by means of friction between the brake lining and the drum. Furthermore, resultant higher heat within the brakes accentuates the problems of "fade" (decrease in coefficient of friction of the lining due to increase in temperature) and "loss of reserve" (the greater pedal travel required to obtain braking effect when the drum expands away from the lining due to increase in temperature).

Progressive changes in conventional hydraulic brakes to meet these problems have been made. Chrysler Corp. pioneered a number of them. One was the development of the two-cylinder brake, making its appearance in 1940. By providing self-energization of both shoes, the two-cylinder brake provided greater fade resistance and more symmetrical lining wear, as well as requiring less pedal pressure. A second change was the substitution of cast iron drums for the original stamped steel type. The cast iron design proved more rigid, providing greater reserve, while the better friction and anti-scoring qualities of the material offered better wearing characteristics. A more recent improvement, adopted first by Chrysler, was the use of linings bonded to shoes with a special adhesive and under heat and pressure. It was an adaptation of the Chrysler "Cycleweld" process which found wide acceptance during the

Fig. 1—(Left) Chrysler self-energizing disk brake

Fig. 2—(Right) Left front brake, showing inner housing assembly, top, and outer housing assembly, bottom





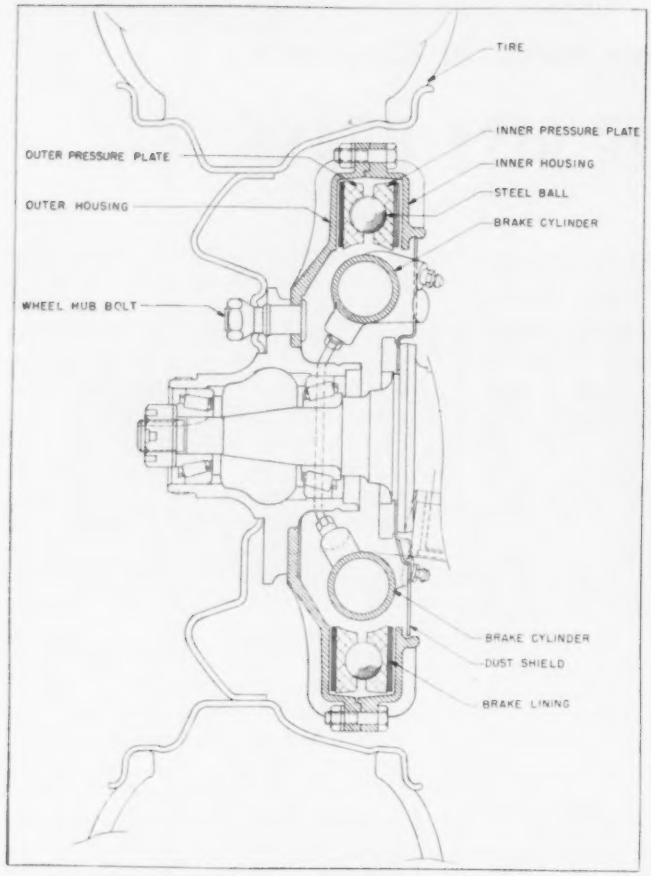


Fig. 3—Chrysler disk brake, showing relative locations of components, assembled

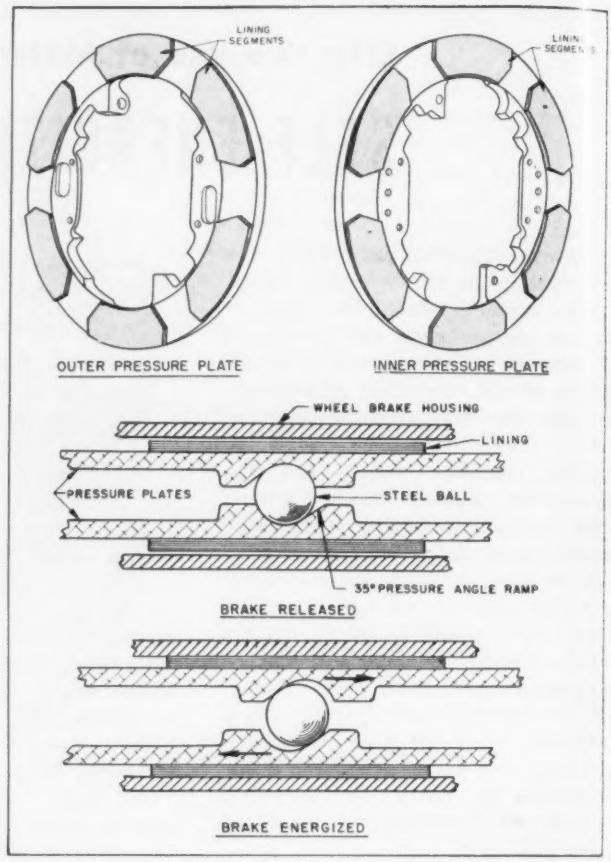


Fig. 4—Drawing showing operating principle of brake

war on a number of aircraft components. By eliminating the former riveted linings, more braking area was provided—about 15 per cent—resulting in longer brake life and reduced scoring of drums.

However, the first real major advance in automotive brake design, just now making its appearance on Chrysler Crown Imperial models, is the self-energizing disk brake. Claimed advantages include more braking effect for the same size brake, less pedal pressure for the same amount of braking, more successive high speed stops without noticeable increase in pedal pressure or reduction in braking effect, less pedal pressure when descending hills with continuous brake application, and automatic self-adjustment throughout the life of the linings.

Basically, the self-energizing disk brake utilizes two 12-inch cast aluminum pressure plates in the form of annular rings inside a cast iron brake housing. To obtain braking the plates are moved apart along the axis of the housing until brake lining segments bonded to the outer surfaces of the plates contact the inside flat surfaces of the rotating housing.

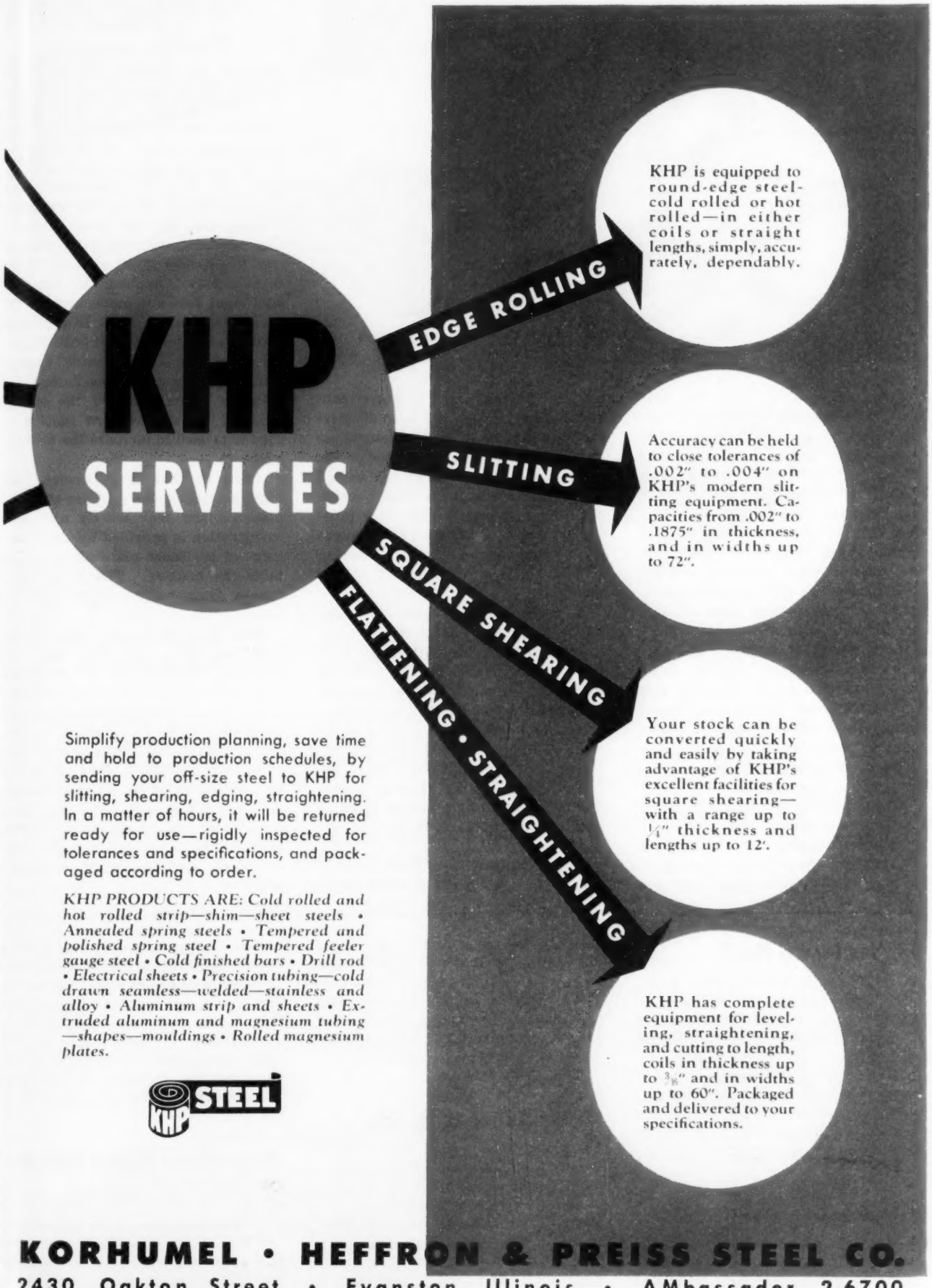
When the outer pressure plate is rotated with respect to the inner plate by movement of the wheel brake cylinder push rods, bearing against bosses on the plate, steel balls located in pockets machined on the inside surfaces of the plates are forced up "ramps" in these pockets, thereby spreading the plates to make contact between the lining segments and the housings.

Brake Housing—The wheel brake housing is assembled from two cast iron halves. The outer housing is bolted to the inner by ten bolts located around the circumference of the housings. The wheel is bolted rigidly to the outer housing so that the housing assembly is always rotating as long as the car wheels are. Both housings carry 40 radial fins to provide more cooling area. It will be noted the inner housing has a 9¼-inch diameter opening which is covered by a stamped steel dust shield after the brake has been assembled to the car.

Plates — Cast aluminum pressure plates or rings, about ½-inch thick, carry six equispaced segments of lining, about ⅛-inch thick, bonded to their outside surfaces. On each pressure plate, six ball ramps with 35-degree pressure angle are machined into the inside surface, equidistant around the ring. At the foot of each ramp is a machined pocket to receive a ⅞-inch diameter steel ball. Two hydraulic cylinders are mounted on the inner pressure plate in such a way as to permit their pushrods to exert a combined rotational force against the outer pressure plate to start the braking action. To provide the desired ratio of braking effect between front and rear wheels, 1¼-inch cylinders are used on front brakes and 1-inch on the rear. Four slots in the inside edge of each pressure plate serve as locating recesses for the spider anchors (described next); since the radial clearance between the end of each anchor and the base of the pressure plate slots is held to a minimum, the anchors prevent the plates from moving radially or off center.

A full lining is not used on the plates because it has been determined that an interrupted design has better cooling characteristics. Each segment is about 4 inches long, and with two pressure plates acting, the brake has about 30 per cent more lining area than the 12-inch shoe-type brake.

Spider—A malleable iron locating spider is rigidly bolted to the steering knuckle on the front wheels and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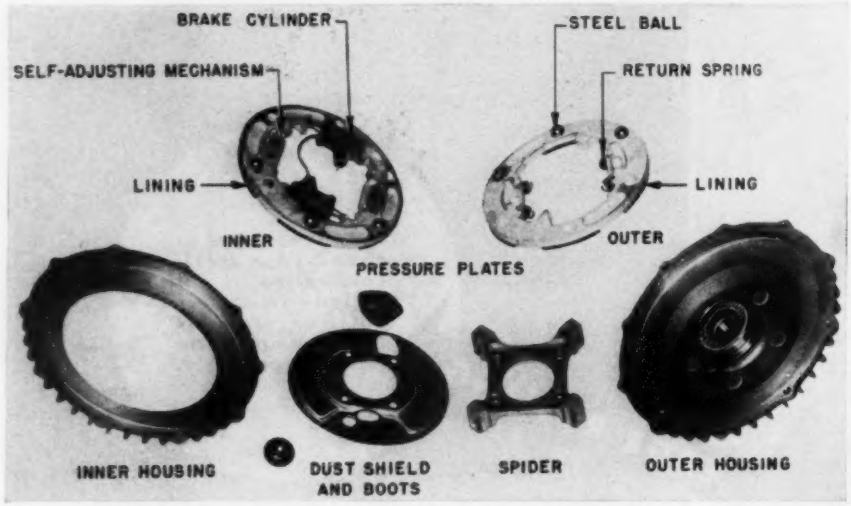


Fig. 5—Component parts, left front brake

to the axle housing on the rear wheels, functioning as both a locater and anchor for the pressure plates. Four anchors on the perimeter of the spider perform these functions, preventing the plates from moving radially and from spinning freely when they contact the brake housing. A spring-loaded plunger is located at the end of each of two adjacent anchors, bearing against the pressure plates to prevent them from rattling due to radial motion.

Four return springs are used in each brake assembly. They are small coil springs and act in the same way as return springs in shoe-type brakes, in that they pull the pressure plates together when hydraulic pressure is released and prevent the plates from dragging on the housing.

An interesting adjusting mechanism has been worked out to compensate automatically for lining wear so that full pedal effectiveness is maintained. Two identical units are mounted on each inner pressure plate diametrically opposed. A small steel plate with two guide flanges is mounted on the inside surface of the inner plate. The flanges are drilled to provide a guide for a pin which bears against lugs on the outer pressure plate. Between the guide flanges and around the pin are a small spring and a steel washer located at one end.

A groove in base plate near one flange keeps the washer in a cocked, or locked, position with respect to the pin when the washer is under load. Travel of the pin against the spring is confined to a distance which automatically provides a clearance of 0.015-0.020-inch between the lining and the housing when the brakes are released. Thus no service adjustment of the brake is required for the entire service life of the lining.

Self-Energization — Self-energization of the disk brake is obtained by utilizing the friction forces which tend to rotate the pressure plates in the direction of housing rotation. When contact is established between the pressure plate linings and the brake housing, the rotating housing tends to drag the pressure plates around with it. During forward motion of the car, the inner plate is held rigid and only the outer plate is free to rotate a slight amount. When the brakes are applied, the resulting additional forward movement of the outer plate with respect to the inner plate forces the six steel balls higher on their ramps to provide greater contact pressure between linings and housing. Thus, some of the energy provided by the forward motion of the car is used to increase the braking effect.

When the car is in reverse, the outer pressure plate becomes the fixed plate on the rear wheels and self-energization is provided by the movement of the inner plate when it contacts the housing. The front wheel brakes are not self-energizing in reverse.

Fade is considerably less in the disk brake as compared with the shoe-type brake because of its 30 per cent greater lining area and superior heat transfer and cooling properties. Greater reserve is obtained because the critical distortion of the housing is across its width parallel to its axis rather than along its diameter. As the distance across the housing is only about one-fourth of the diametral distance, expansion of the housing away from the lining is negligible.

Are You Buying Pipe?

ADVANTAGES and services available when buying new-tested pipe, hydraulic pipe, double extra heavy pipe, light weight tubing, and spiral weld pipe from L. B. Foster Co., Pittsburgh, are detailed in a four-page reference folder on pipe and pipe fabrication, published by the company. Information is given on pipe sizes, prices, weight and dimensions.

Lists New Line Prices

SIZES and prices for its new line of standard blanks for pulley grooving tools and heavier duty lathe and grinder center blanks are listed in the supplement No. 8 to the tool catalog of Carboloy Co. Inc., Detroit, Mich. Six sizes of carbide blanks designed for tools used in machining pulleys for A, B and C type V-belts are available from stock in two Carboloy grades. Seven standard sizes of carbide lathe and grinder center blanks, including larger sizes than previously available, supersede the company's former line.

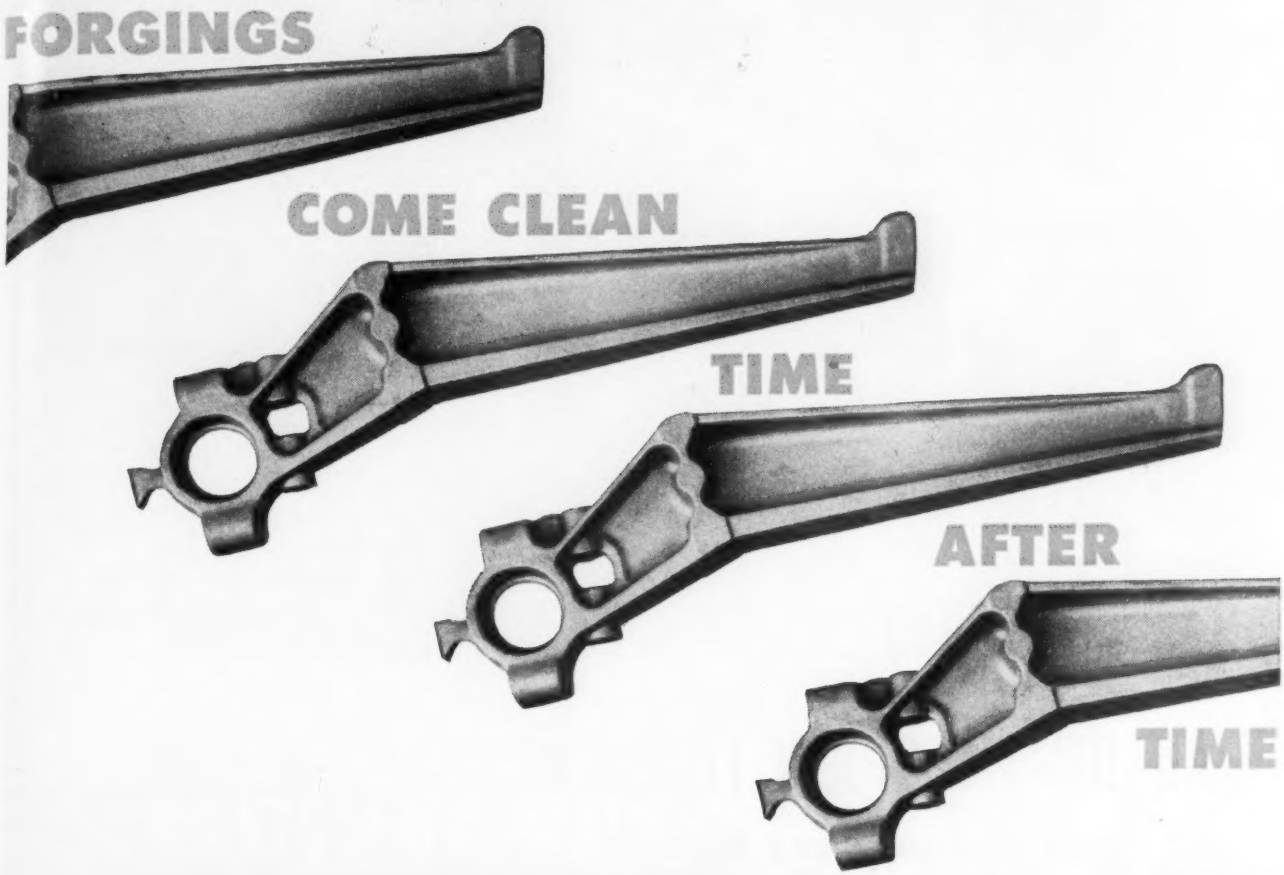
Rubber Bearing Adds Life

FIELD tests in west Texas, Panhandle and Louisiana oil fields, have shown that a new rubber bearing, which simplifies design of oil well pumping units, has a long life. Used in the evener assembly, the new bearing, developed by United States Rubber Co., and Cabot Shops Inc., is said to reduce from 100 to 38 the number of parts required for pumping unit construction.

A special test unit with a rubber evener bearing assembly was given a severe unbalanced load and operated at three times normal field operating speed and, after more than 40,000,000 cycles, outwore many of the structural metal parts in the unit and still maintained serviceable operating condition. It was also found that the rubber bearing greatly reduced shock load.

Water Vapor Physics Bulletin

OFFERED by Pittsburgh Lectrodryer Corp., Pittsburgh, is the second in a series of illustrated bulletins on the fundamental physics of water vapor as related to solid adsorption dehumidification. Entitled, "The World Is Sopping Wet," the bulletin is so prepared and presented as to be readily understood by the layman although it is a technical explanation.



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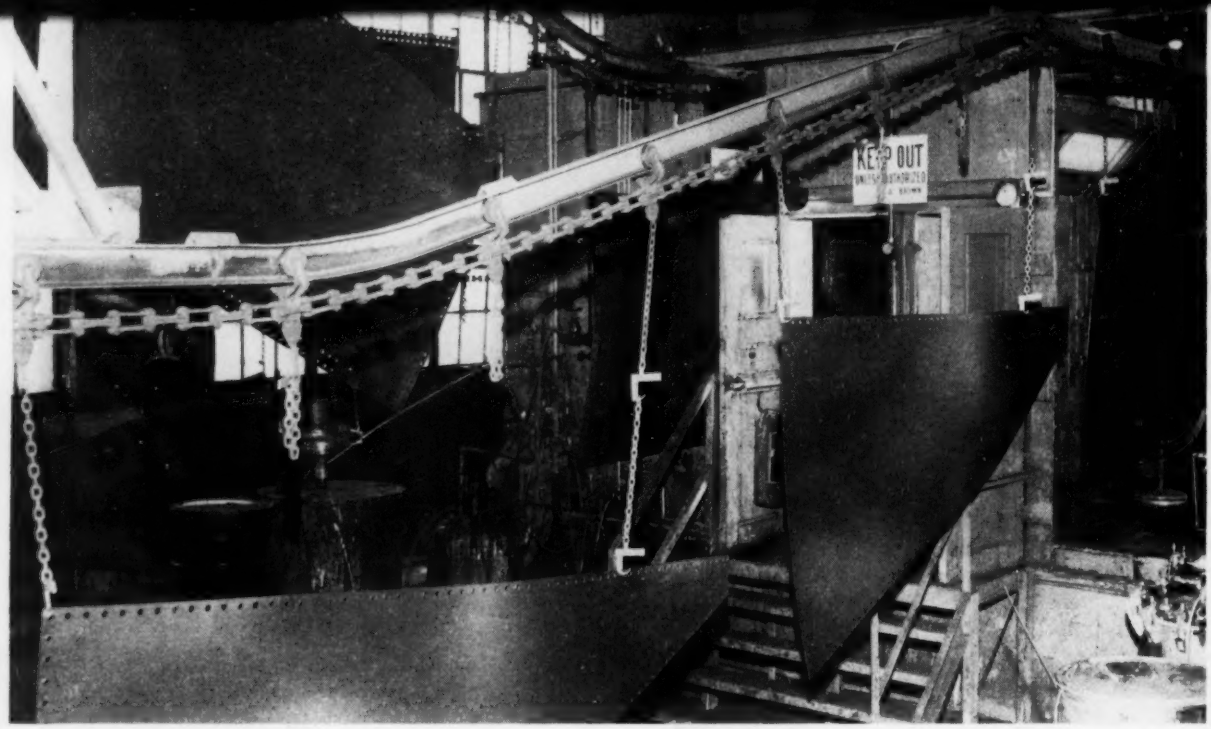

AUTOMATIC SPRAY FINISHING

Saves Manpower and Materials

IN a completely conveyorized operation, both flanged and pie-shaped bolted tank plates for fuel-oil storage tanks are washed, painted and baked at high speed in the Kansas City plant of Butler Mfg. Co. Conversion to electrostatic paint spraying for application of both primer and finished coats currently enables the company to process upwards of 60 tons of steel tank parts per shift.

The electrostatic spray process, developed by Ransburg Electro Coating Corp., Indianapolis, was adopted primarily as a means of improving working conditions, which were unfavorable due to the overspray when painting was done by hand. Besides better working conditions, advantages derived from the installation include improved finishing, a savings of more than 50 per cent in the cost of the coating materials used, plus the saving of labor time of three men who are released to other production work.

Spray Booths Side by Side—In the plant, body sheets and pie-shaped deck sections are primed in iron oxide and finished in aluminum paint. Spray booths for applying both coats are installed side by side on the same conveyor line, which also serves the washing unit before prime coating and the baking oven after finish coating. With the present setup, at the conveyor speed of 26 feet per minute, the entire finishing operation is automatic from loading to unloading.

Decision to convert the line to electrostatic spraying stemmed from the company's war-time use of the process. But before going ahead with the conversion,the company analyzed its hand-spraying costs to obtain a good basis for comparison afterwards. It was found that there was a 57 per cent savings in prime material and a 58 per cent savings in finish material. Efficiency of the process, created by the compelling attraction established between the electrically grounded work and the fine fog of atomized paint particles which are negatively charged when they enter

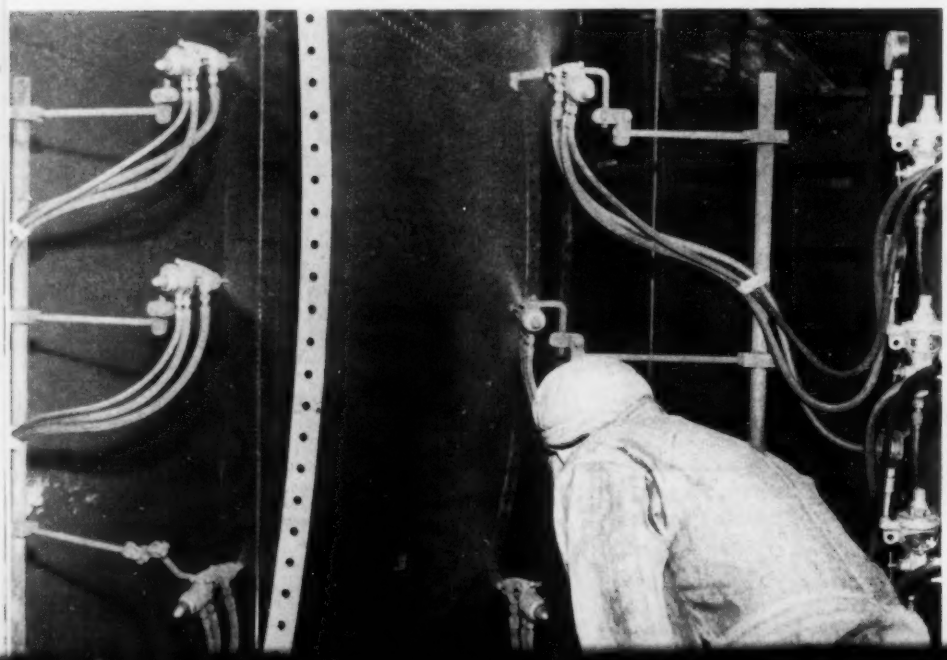

Fig. 1 (above)—Prime paint spraying booth on left and finish booth on right are separated, but are served by same exhaust system. Entrance end of each booth is used for electrostatic spray and exit end for minor hand touch-up

Fig. 2 (left)—These six automatic spray guns, with individual fluid regulators, apply one complete coat, except for hand touch-up required on inside corner of leading flange. One operator attends electrospray operation and performs the touch-up operation

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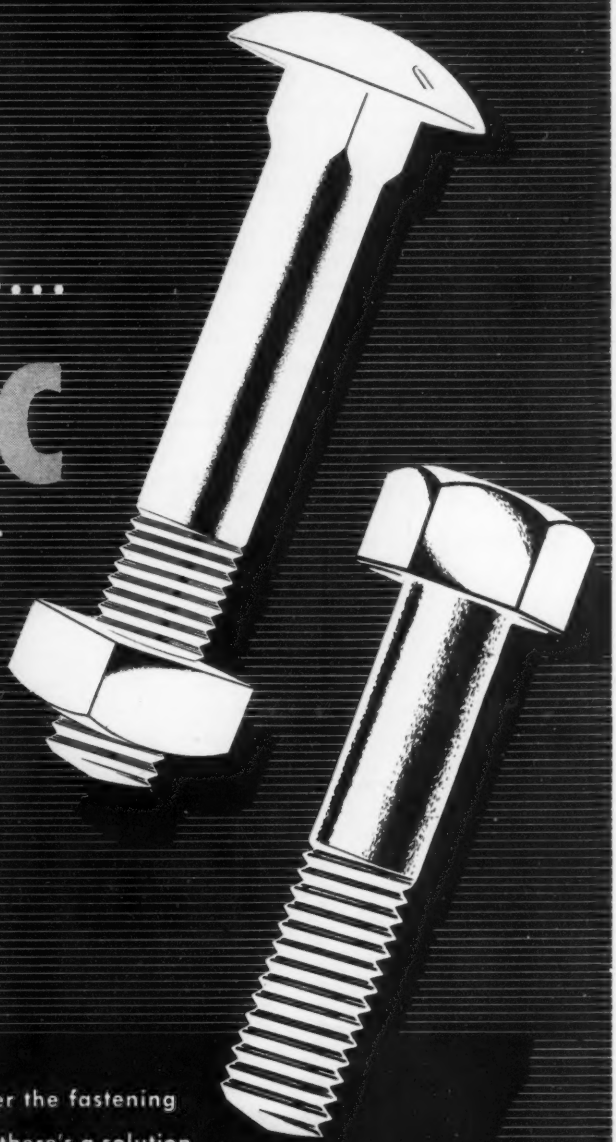

Whatever the fastening problem, there's a solution to be found in REPUBLIC'S *full line* of more than 20,000 different sizes and shapes of headed and threaded products. From clean, sharp threads to sound, full heads, they offer positive assurance of lasting fastening satisfaction. Republic Steel Corporation... Bolt and Nut Division, Cleveland, Ohio and Gadsden, Ala.... Export Department: Chrysler Building, New York 17, N. Y.

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the electrostatic field, was found to be the largest single factor in the saving.

Formerly, two hand spray men were required in each booth, each spraying one side of the work; in addition, a relief man was needed, making a total of five men. Only one man is now needed in each booth and no relief man is required due to the improvement in working conditions. Thus, three men were made available for other work.

Better Finishing Quality—Improvement in quality is affected on inside edges of attaching bolt holes and outside edges of sheets. This is accomplished by the "wrap-around" feature inherent in the electrostatic process. Uniformity of film thickness, difficult to obtain by hand spray at high conveyor speed used, is now assured automatically.

Modification of the existing hand spray booths was accomplished easily and at small expense, Butler states. Original booths were of the downdraft type. To make these suitable for electrospray, it was necessary to install an exhaust plenum chamber to provide a horizontal air flow through the spraying chamber. Other modifications entailed opening up the front and covering the top and the floor of the spraying chamber. Effectiveness of the installation is such that it is now being employed to coat such other items on the same line as display rack standards and grain bin covers.

Rare Gases Offered in Quantity

RARE gases krypton and xenon, occurring in the atmosphere in one part in 1 million and 12 million respectively, have been made available in commercial quantities, according to Linde Air Products Co., New York. These gases are inert and will not combine with other elements under any conditions. In comparing krypton and xenon to argon, the most widely used rare gas, these two have the advantage of lower thermal conductivity, lower electrical resistance, and lower ionizing potentials, it is reported. Refined krypton and xenon are available in glass flasks and in steel cylinders for larger users.

Sheet Metal Forming Method

. . . features close pressure control

FORMED sheet metal parts can be produced at savings reported to be as high as 50 per cent through use of a new metal forming method known as Marform. According to tool research engineers who developed the process at Glenn L. Martin Co., Baltimore, the new technique can save the aircraft industry hundreds of thousands of dollars annually and effect significant economies for other industries using metal forming methods.

New method is said to result in a substantial increase in rate of production of numerous types of detailed parts, and a considerable decrease in labor and tooling costs. Furthermore, parts so produced are held to close dimensional tolerances usually obtained only by expensive tooling. Stainless steel exhaust stacks, for example, can be formed with important reductions in tooling cost and at a manufacturing rate increased over ten-fold in comparison with conventional methods. The estimated rate of production is 50 per hour.

In the forming of these parts, uniform cross-sectional thickness is very important to attain the required strength and to increase service life. A variation greater than 5 per cent in material thickness is unusual in severely formed parts made by the new process.

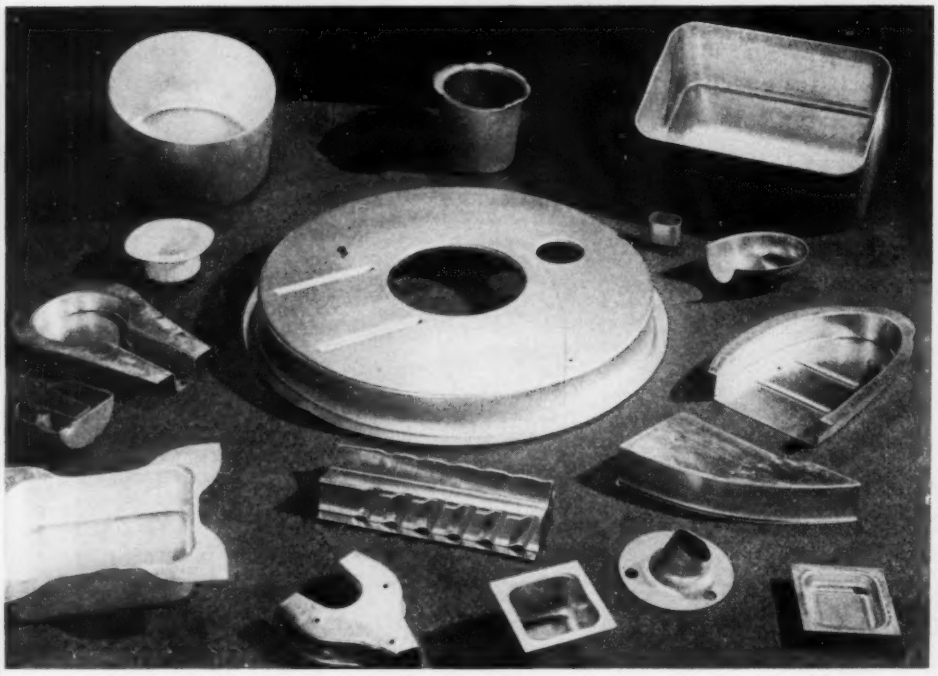
Precision control of the pressure curve for the forming cycle of the part is the principal feature responsible for the success of the process. This control of the pressure enables a part to be formed free of wrinkles; it also reduces springback to a minimum. An operator can make complex sheet metal parts involving drawing, shrinking and stretching at the rate of 50 to 120 per hour at present. Multiple tooling and future improvements will increase this rate proportionately.

In addition to simple draw operations, the process can be utilized to form and trim flanged parts such as airplane nose ribs. Such nose ribs are entirely free of wrinkles. No flutes are needed to absorb excess metal because the metal is shrunk into itself to form a perfectly smooth constant gage flange. A comparable piece formed in a conventional manner requires about 15 minutes of bench work to hammer wrinkles out of the flange. The production rate is, therefore, three to four pieces per hour compared to 120 per hour for the Marform process. Reduced assembly time and a smoother airfoil contour are also gained with the new technique.

Sheet metal parts can be made to a tolerance of ± 0.002-inch. A tolerance of ± 0.005 is commonly attained on parts where the shape is sufficiently rigid to maintain such accuracy.

The process often can be used to shear, as well as form, in the same operation. The shearing action can be parallel to the forming stroke, perpendicular, or at any other angle. Shearing is accomplished without expensive auxiliary devices.

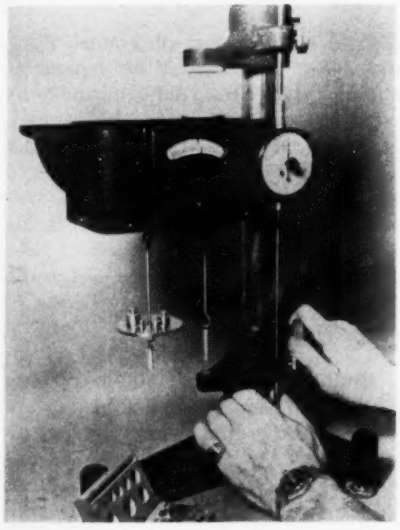
Examples of wide variety of parts which can be formed by the Marform process. Metals included in parts shown here are 24S, 52S, 3S, 2S aluminum alloys and stainless and deep drawing steel



New Products and Equipment

High Production Spring Tester

Spring testing machine offered by Baldwin Locomotive Works, Philadelphia 42, Pa., is designed for high production inspection and testing of any type of small spring within the limits of 12 inches in length and 5 pounds of load. Developed by Hunter Spring Co., of Lansdale, Pa., the machine will test coil, flat, special design or spring assembly. It is use-



ful for springs made of wire sizes from 0.005 to 0.030-inch in diameter.

Machine is sensitive to load changes of less than 5 milligrams and has a weighing accuracy of plus or minus 0.10 per cent. When set for a required load and a given extension or compression of spring, a pointer amplifies weighing beam motion 10 times and indicates on a curved scale the force being applied by the spring, or whether or not the spring is within tolerance limits.

Check No. 1 on Reply Card for more Details

Faster Cutting End Mills

Less breakage, many more cuts per grind, consistent accuracy and up to 50 per cent increase in feed are claimed for the redesigned line of end mills, introduced by Cleveland Twist Drill Co., 1242 E. 49th St., Cleveland 14, O. The redesigned flutes are machine polished and there are no pockets. Chips are free to move. Closer control of size is a result of new clearance and accurate machine polishing of the flutes.

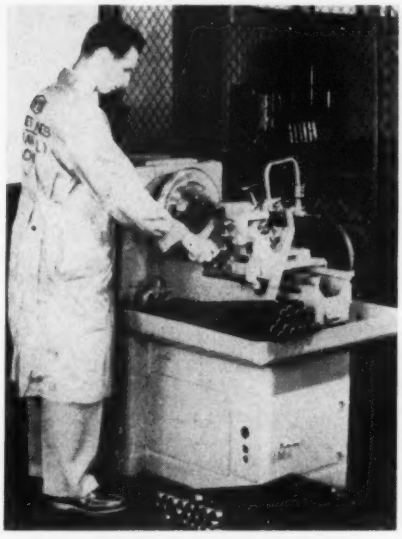
Other new design features include no sharp corners or points where localization of stresses might occur. New-style clearance supports the cutting edge and assures against flaking or chipping out. The new flute shape and chip clearing ability reduces wear on the cutting edge.

Check No. 2 on Reply Card for more Details

Fast Threading Machine

Speed selector switch and push button control for standard voltages are time-saving features of the No. 702 Wilco threading machine offered by Oster Mfg. Co., Cleveland 3, O. Regular pipe range is ¼ to 2 inches; extra pipe range is ⅛-inch; bolt range is ¼ to 1½ inches. Faster threading and minimum handling of stock are made possible by a 3-speed motor of 900, 1800 and 3600 rpm and spindle speeds of 40, 80 and 16 rpm.

Additional features include worm gear drive with ball bearing mounted spindle, Spin-Fast wrenchless front chuck, nonlocking rear centering chuck, die-heads with segmental dies and length gage for quick setting to



size for threading and calibrated gauge for cutting-off. An individual drive centrifugal coolant pump is located in front of the die head. Machine threads short lengths of pipe on both ends without a nipple chuck. Carriage travel is 12 inches and length of ways 30 inches.

Check No. 3 on Reply Card for more Details

"Clear Vision" Crane Cab

Almost 100 per cent clear vision in any direction at all times is provided the crane operator with the clear vision control cab made by Northern Engineering Works, 2615 Atwater St., Detroit 7, Mich. Cab, which can be used only when full magnetic control of all crane motions is used, increases overhead traveling crane efficiency, provides greater safety, and minimizes maintenance and down time costs.

Two upper master switches control hoist and trolley motions respectively. Bridge travel motion is controlled by foot-operated master switch. The hydraulic bridge brake is controlled by the operator's other foot. Controls may be easily operat-

ed from either sitting or standing positions and cab may be enclosed in glass where conditions require. Brake includes an integral dynamic braking feature which automatically applies electrical braking on the bridge motor before the hydraulic brake action begins, this preventing excessive wear on the hydraulic brake.

Check No. 4 on Reply Card for more Details

Enclosed Motors

Copper fins embedded in the stator laminations for additional cooling are incorporated in the type CS, totally-enclosed, fan-cooled, squirrel-cage motors produced by Westinghouse Electric Corp., Pittsburgh 30, Pa. Rapid conduction of heat from the stator is accomplished by circular copper punchings at intervals among the core laminations. Additional copper fins are fabricated with steel parts to form large, cylindrical heat exchangers at both ends of the motor around the end turns.

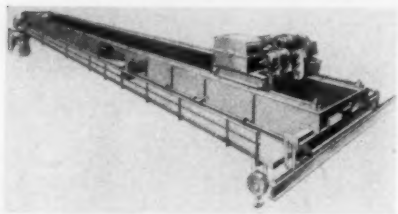
Motors are suitable for application in coal pulverizing plants, steel mills and other locations where the atmosphere is contaminated with dust particles that are injurious to an open motor. They are not designed for outdoor locations where foreign ma-

terials in such quantities might obstruct the ventilating openings. Motors are offered in large ratings up to approximately 1500 hp at 1800 rpm, class B insulation, 75 degrees Centigrade rise and other electrical characteristics similar to those that can be obtained in standard, open, squirrel-cage induction motors.

Check No. 5 on Reply Card for more Details

Overhead Cranes

A streamlined, full-vision cab, simplified magnetic controllers and fluid-drive hydraulic couplings on both bridge and trolley motors, are incorporated in the design of overhead traveling cranes manufactured by Whiting Corp., Harvey, Ill. Cab pro-



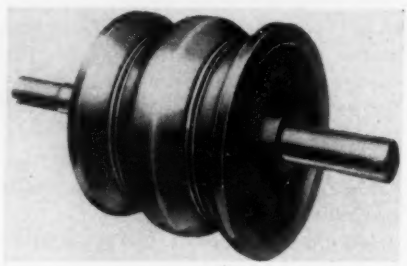
vides maximum ease and comfort for operator with the wide range of vision. By moving short, fingertip levers, the operator controls all crane motions from a seated position.

Using magnetic controllers, only low voltage is run into the cab. This results in elimination of larger-type equipment, reduces maintenance and adds to motor life. Hydraulic couplings allow use of electric motors and result in faster pickup and quicker braking. With fluid drive, plugging (the sudden reversal of motors) is not harmful nor dangerous.

Check No. 6 on Reply Card for more Details

Magnetic Pipe, Shape Roll

Designed to eliminate burnouts and maintenance problems caused by high ambient temperatures, steam and fumes in galvanizing processes are permanent nonelectric magnetic pipe and shape rolls, developed by Eriez Mfg. Co., 835 E. 12th St., Erie,



Pa. Designed for the "drag out" of pipes and shapes from galvanizing pots, the units require no electricity or wiring, consequently can withstand temperatures up to 800° F.

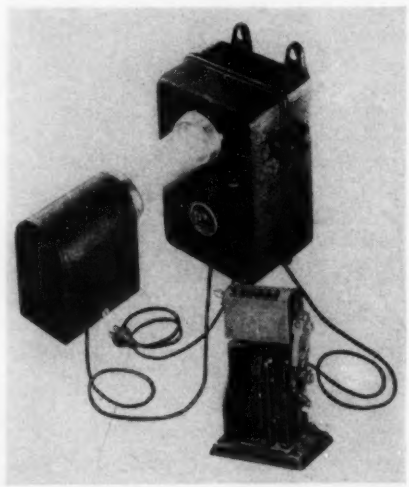
Primary difference between the pipe and shape roll is that pipe roll has a magnetic field designed to automatically center the pipe or rounds so that a minimum clearance between the pipe and steam eye is possible. Shape rolls contain a surface which is completely magnetic; any size or shape of material can be conveyed. Pipe rolls are ordinarily installed four to six to a tandem, will handle pipe ranging in size from ⅜ to 6 inches in diameter.

Check No. 7 on Reply Card for more Details

Photoelectric Counter

Consisting of photoelectric control, light source and electric counter, the photoelectric counter set P-1, available from Photoswitch Inc., 77 Broadway, Cambridge 42, Mass., is a completely packaged, general purpose counter. The only equipment which is located at the point of count is the control and light source. One or more electric counters may be placed at any convenient location and wired to the control.

It may be used for counting on loading chutes or conveyors, for



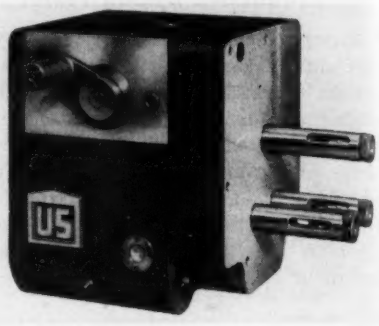
counting freshly painted, hot and small objects, and for selective counting by height and length. Light source has an adjustable lens system which permits narrowing down the light beam for counting very small objects. Up to 600 pounds per minute may be made. Maximum operating range is 6 feet between photoelectric units and light source.

Check No. 8 on Reply Card for more Details

Drill Head

Built to give the machining of different materials the correct peripheral speed on the tools such as drills, taps, and reamers from a single speed drive unit is the multiple spindle drill head announced by U. S. Drill Head Co., Cincinnati 4, O. Head is oil-lubricated so that it can be operated at high speeds. The maximum speed recommended is 15,000 rpm.

All shafts are mounted on ball bearings. Gears are made of heat-



treated high carbon alloy steel. Spindle speed is changed by means of sliding type gears, this being done by rotating the head lever 180 degrees. It is not necessary that the speed of all the spindles be changed when only some spindles, performing such multiple operations as tapping or facing large diameters, are needed.

Check No. 9 on Reply Card for more Details

Arc Welder

Built in 300 and 400-amp sizes is the Wilson model 36A Yellow Jacket heavy duty arc welder, offered by Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y. A direct current, 40-v, variable voltage generator, it features simplified control of current output by means of a hand-wheel mounted on the control cabinet. For instant recovery voltage over a short circuit, the generator is self-excited with excitation of the main field obtained through an auxiliary brush.

Welding terminals are located and adequately spaced to prevent accidental shorting. The belt drive reduces vibration problems by automatically compensating for slight misalignments. Power is furnished by a 6-cylinder industrial engine and unit is available in stationary or portable models.

Check No. 10 on Reply Card for more Details

Automatic Cycle Arrangement

Two automatic cycle arrangements for Nos. 5, 10, 12, 20, 22, and 23 plain grinding machines made by Brown & Sharpe Mfg. Co., Providence 1, R. I., provide accuracy and reduce idle time of the machine, in addition to requiring less operator attention and reducing spoiled work. The automatic cycle and spark-timing arrangement assures rapid uniformity of sizing and finish as the spark time is set at a predetermined figure from 2 to 180 seconds. Work is

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Signed By_____

Address_____

City & State_____

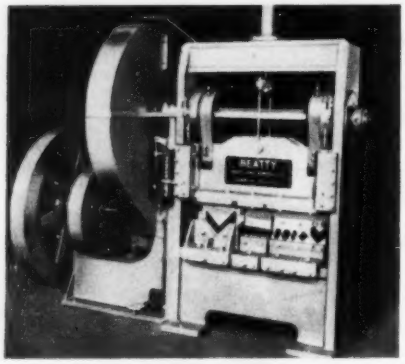
sized from the machine's accurate crossfeed mechanism and wheel wear and truing are compensated for. Operator merely makes a single oscillatory movement of the crossfeed handwheel, bringing the wheel into direct contact with the work, then engages the pawl.

Automatic cycle and sizing arrangement further reduces skill required for accurate production grinding as it sizes directly from the work, eliminating compensating for wheel wear and the effects of wheel truing. After loading, a single oscillatory movement of the crossfeed handwheel and placing the sizing gage on the work is all that is required. The cycle is completely automatic. Before reaching the finished size, the cycle switches from coarse feed to fine feed by means of a predetermined setting of the work sizing gage. Indicating lights on the front of the panel aid in setting up the machine.

Check No. 11 on Reply Card for more Details

Bar Shear

Designed for the shearing of rounds, angles, bars and squares without changing tools is the guillotine bar shear announced by Beatty Machine & Mfg. Co., Hamond, Ind. Suitable for either production or "short order" shearing, it provides a 48-inch



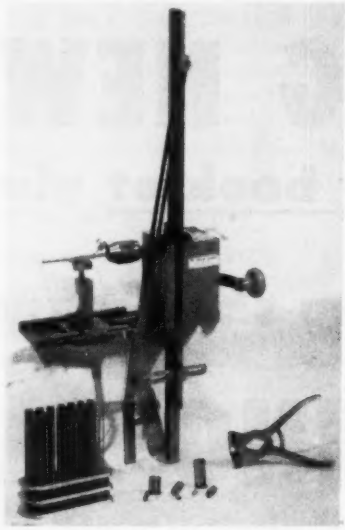
base for mounting tools, these including two sets of angle shears, one for handling squares and shears to handle three sizes of round bars.

Other tools for shearing other shapes can be provided. Machine is available in capacities from 50 to 450 tons.

Check No. 12 on Reply Card for more Details

Spring Coiling Machine

Both left and right hand compression, extension and torsion springs may be wound with a semiautomatic machine offered by Carlson Co., 277 Broadway, New York 7, N. Y. Machine is useful for coiling small quantities of springs and for making samples. Setup time is only a few minutes and springs may be wound from spring steel, music wire, stainless steel, phosphor bronze or any spring material. It comes with an arbor rack containing 29 arbors made from ground, polished and hardened



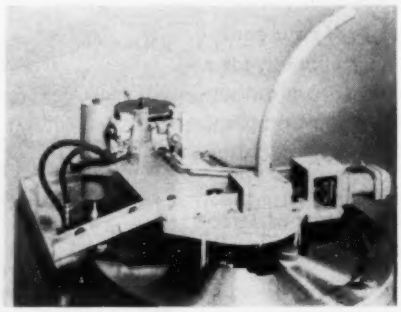
drill rods in sizes from 1/16 to ½-inch diameters by 64ths.

Spring coiler No. 1 will handle wire diameters up to 0.063 inch and will coil springs up to ¾-inch in diameter. Larger outside diameters are obtainable with special arbors. Springs up to 4 inches in overall length and up to 25 coils, can be produced. Pitches are adjustable from zero up to a wide range.

Check No. 13 on Reply Card for more Details

Thread Rolling Machine

Model A22 and A23 die thread rolling machine, manufactured by Reed Rolled Thread Die Co., Wooster, Mass., are supplied with either manual or semiautomatic feeds for rolling 1/16 to 2-inch pipe threads at the rate of 300 to 1500 per hour. They



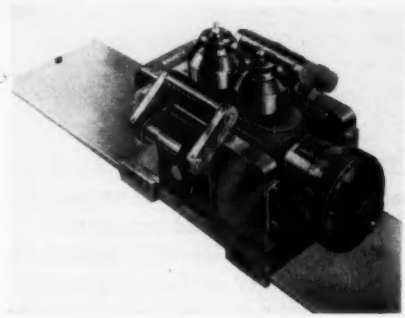
may be used for the manufacturing of pipe plugs and fittings made from miscellaneous steels including stainless, brass, bronze and aluminum. Photograph shows an A22 machine arranged with an automatic feed for pipe plugs.

Work blank is supported in position between three synchronously rotating cylindrical dies. The three dies act on the blank simultaneously and hold it rigidly in proper rolling position. As the work rolls between the dies, the rolling pressure causes the material to follow the pattern of the dies. Control of work dimensions is accomplished by adjustments for diameter, length and taper. An air-operated ejection mechanism discharges the threaded blanks into the discharge chute.

Check No. 14 on Reply Card for more Details

Continuous Width Gage

Uniform diameter of size in the production of bare or insulated round or flat wire may be checked with the new continuous width gage which indicates the diameter or width of a continuous roll or wire or thin strip material as it is being processed. Made by Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford 1, Conn., the model B magnetic gage consists of the gage head, slide base, meter and power unit. Gage head has two gaging rolls which are



in continuous contact with the wire or material as it passes through the gage.

Any variation in diameter or width from the predetermined setting is greatly magnified electrically and shown on the indicating meter. Gage is set directly to the required measurement by a micrometer dial and no masters are required. It can be used with a control meter to signal the operator or to automatically make corrective adjustments to maintain the predetermined measurement.

Check No. 15 on Reply Card for more Details

Tool Room Furnace

Design changes in the Sunbeam-Stewart wide-range oven offered by Sunbeam Corp., 4433 Ogden Ave., Chicago 23, Ill., make it practical for a wide variety of metal heating processes in tool rooms and shops. An inverted muffle section quickly converts the furnace from semimuffle to full muffle for atmosphere hardening. A removable rear plug permits

center heating of long bars. Unit operates over a 300 to 2400° F temperature range.

New combustion chamber design and location plus a 95 per cent turn down ratio of the nozzle-mixing burners provide high turbulence to the combustion gases to make wide temperature range possible. Furnace sizes available are 4 x 8 x 12 inches, 6 x 12 x 18 inches and 9 x 15 x 24 inches. Furnace is adaptable to 2-valve manual control or automatic temperature control employing an air/gas proportioning valve.

Check No. 16 on Reply Card for more Details

Steam Cleaner

Compact design and high output of 110 gallons of vaporized solution per hour features the model Q steam cleaner, available from Kelite Products Inc., Box 2917 Terminal Annex, Los Angeles 54, Calif. Automatic pump, all-steel welded construction,

automatic fuel regulator and safety shut-off, high velocity nozzle, aerated gun grips are incorporated in the design.

Cleaner is a completely enclosed cabinet type unit, requiring no special skills to operate. The stationary model weighs 465 pounds. Portable models are also available.

Check No. 17 on Reply Card for more Details

Magnetic Separator

Automatic removal of tramp iron is possible with the permanent drum Alnico magnet equipped magnetic separator, offered by Dings Magnetic Separator Co., 4740 W. Electric Ave., Milwaukee, Wis. Available with shaft and V-belt drive sheave, the magnet can be installed at the discharge end of chutes, spouts and conveyors, etc. Circumferential pole design makes for uniformity of magnetic field across the drum width.

Manganese alloy drum shell revolves on sealed, self-aligning ball bearings while the Alnico magnet inside the drum shell remains sta-

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tionary. Tramp iron holding fast to the drum by the magnetic pull, drops off when it passes out of the magnetic field. Types with the Perma-Drum fully enclosed are available. Housing is of all metal, dust-tight welded construction, equipped with enclosed electric motor and speed reducer drive, top and bottom flanges for quick installation in chutes and ducting.

Check No. 18 on Reply Card for more Details

• • •

ROTARY TOOL: A new Thor rotary pneumatic tool designed to drive screwsticks, a development of American Screw Co., is announced by Independent Pneumatic Tool Co., Aurora, Ill. Tool is a 1¾-pound machine measuring only 6½ inches in length.

Check No. 19 on Reply Card for more Details

DRY LUBRICANT: Type Z Molykote lubricant is a smooth textured molybdenum compound powder for extreme bearing pressure applications. Made by Alpha Corp., Greenwich, Conn., it may be applied dry in the powder form or may be mixed with solvents, oils or greases. Its characteristics are not affected by temperature from subzero range to 750°F.

Check No. 20 on Reply Card for more Details

BELTS: Round endless belts for use on drills, high speed hammers, tappers, saws and other small machinery applications have been added to the Rainbow line of United States Rubber Co., New York 20, N. Y. They are of round cross-section design built without a splice and are available in sizes ranging from 3/16 to ½-inch belt diameter and from 6⅞ to 156⅜ inches inside circumference.

Check No. 21 on Reply Card for more Details

END MILL: A new type end mill completely formed from solid carbide has been developed by Wendt-Sonis Co., Hannibal, Mo., for production runs on close tolerance slotting and key way cutting operations in cast iron, mild heat treated steels and all types of nonferrous, nonmetallic materials. They are available in straight or spiral flute design in sizes ranging from 3/16 to ⅝-inch.

Check No. 22 on Reply Card for more Details

TESTING MACHINE: Known as model PO-40, a new portable tensile tester is announced by Steel City Testing Machines Inc., Detroit 4, Mich., is adapted for testing pipe welds, and other types of welds where on-the-job testing is preferable. Capacity of the unit is 40,000 pounds and it will make tests on specimens from 6 to 13 inches in length up to ⅜-inch thick and 2¼ inches wide. Operation is hydraulic.

Check No. 23 on Reply Card for more Details

SCRIBER: A new method of brazing tungsten carbide into the core and extending from the tip of a steel handle is the new scriber, manufactured by Niagara Instrument Corp., Lockport, N. Y. The carbide tip permits sharpening without burning or softening for many grindings and will scribe clean lines on tool bits, hardened steel, chromium, stone, or any required surface.

Check No. 24 on Reply Card for more Details

GOGGLE LENS: American Agile Corp., Cleveland 3, O., announces newly designed Metalklad oxyacetylene goggle lens that eliminate all heat radiation and flame glare. A new, hard and nonferrous alloy of high reflectivity is used on the surface of the lens, achieving a mirror-like finish which completely reflects all harmful and interfering rays given off by the torch flame.

Check No. 25 on Reply Card for more Details

HANDLE: By attaching the pressure handle, made by Pressure Handle Co., Wilkes-Barre, Pa., to standard portable electric or pneumatic drills, an operator can control drilling pressure of the tool by turning the handle. One end of feed chain is fastened to work, the other placed over chain sprocket on the handle. By twisting handle, force is transmitted by a worm gear to the sprocket which rotates and creates a pulling force on the chain.

Check No. 26 on Reply Card for more Details

EXTRACTOR: Ez-Pul pierce die button extractor, introduced by L. C. Ball Associates Inc., Detroit 26, Mich., requires only four simple steps to pull straight or taper hole insert, without removing dies or die sections from press. Two standard sets are available to pull inserts from 0.2031 through 0.7031-inch.

Check No. 27 on Reply Card for more Details

GOVERNOR: A microswitch centrifugal governor designed to turn off motor, engine or other electrically energized equipment when a predetermined speed limit has been exceeded, is announced by Pierce Governor Co., Anderson, Ind.

Check No. 28 on Reply Card for more Details

ELECTRODE HOLDER: A miniature inert-arc electrode holder, featuring a flexible front-end assembly made of malleable copper tubing surrounded by a sheath of silicone rubber so that it can be bent in any direction is announced by General Electric's Welding Division, Schenectady 5, N. Y. Designed for fluxless welding of nonferrous metals in thinner gages from No. 16 to No. 40, it is available in two models: One for 0.010 and 0.020-inch tungsten electrodes and the other for 0.040 and 1/16-inch tungsten electrodes.

Check No. 29 on Reply Card for more Details

FACE MILL: Ingersoll Milling Machine Co., Rockford, Ill., announce a new development in their Shear Clear face milling cutter with carbide tipped blades for high feed rates milling cast iron. Cutter embodies principle of cutting on bevel portion of blades which are set into housing at negative radial and positive axial rake angles. There are 38 blades in a 10-inch cutter.

Check No. 30 on Reply Card for more Details

VALVE: The pressure regulator valve offered by Lear Inc., Elyria, O., reduces pressures from as high as 100 psi to any constant lower pressure. It compensates for variations in liquid fuel or water consumption by holding outlet within narrow limits.

Check No. 31 on Reply Card for more Details

MOTORS: The new type gear motors, offered by Sterling Electric Motors Inc., Los Angeles, Calif., are of Klosd-Tite construction for atmospheres containing nonexplosive dusts, vapors and injurious foreign materials. Type FWFB is totally enclosed and includes labyrinth seals, heavy duty ball bearings lubricated for life and the company's patented Herringbone rotor.

Check No. 32 on Reply Card for more Details

METAL CLEANER: For reverse current cleaning of zinc base die castings prior to electroplating, a new improved cleaner is announced by Pennsylvania Salt Mfg. Co., Philadelphia 7, Pa. Recommended concentration for Pennsalt cleaner Z-54 is 5 ounces to the gallon; solution temperatures may average between 180 and 190° F.

Check No. 33 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

METALWORKING plants are able to feel fairly secure as to their inventories of steel amid the rumblings of protracted controversy between management and labor in the steel industry. Consumers' inventory positions have been strengthened both by reduced consumption and by protective buying of steel.

Uncertainties stemming from the labor situation continue to generate precautionary buying and will likely do so right up to the time the steel labor controversy is settled. The coal mine labor trouble is contributing only slightly toward the inclination to make protective purchases of steel, for the steel mills hold substantial fuel stocks and will not soon face coal shortages that would require drastic curtailment in operations.

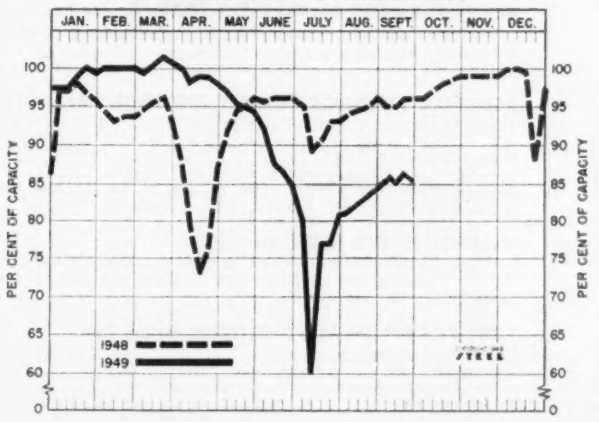
Improved demand for pig iron and coke reflects the fear of coal shortages to a greater extent than that for steel products.

BUYING—While protective covering stands out in steel market activity, ordering is increasing for delivery after settlement of the steel labor controversy. Such ordering of flat-rolled products is pronounced. Most producers of cold-rolled and galvanized sheets are sold out through the rest of the year. Enameling stock is in stronger demand, and so are stainless and silicon stock. Merchant pipe trade is strong. Forward commitments for heavier products, such as bars, shapes and plates, continue modest. Plate sellers have relatively little work ahead of them because activity lags in railroad shops, shipbuilding, machinery, petroleum and other industries requiring heavy goods. Building construction is holding up better than had been expected but a seasonal decline is in prospect. Increased attention is focused on automotive requirements for the fourth quarter. This industry has been the major prop to steel demand for some months and a sharp drop in its requirements in the closing months of the year would be severely felt, especially in cold-rolled sheets. Pickup in demand from the appliance and heating industries is an encouraging development for the flat-rolled producers as they await automotive industry developments.

PRICES— STEEL's weighted finished steel index held at 152.52 while the arithmetical price composite on this classification also held unchanged at $91.55. Price composites on steelmaking scrap advanced for the seventh consecutive week to $27.08 from $26.92 the preceding week, although the market was somewhat less active. A year ago the steelmaking scrap composite stood at $43.33. The pig iron composites held steady and compared with the like week of 1948 as follows: No. 2 foundry, $46.10 and $45.13; malleable $47.27 and $45.63; basic, $45.60 and $44.94.

DEVALUATION— Monetary devaluation by more than a score of nations is expected to cause some reduction in exports of steel from the United States, for the devaluation is equivalent to an increase in the price of steel produced here. Severity of the export decline will be softened by the fact foreign production facilities are limited, and foreign purchases of steel under the Marshall Plan must largely come from the U. S. Also domestic prices can be expected to rise abroad and gradually offset any temporary advantage which currency devaluation may give foreign consumers in purchasing at home. Whether the British will be able to to cut into American steel export trade appreciably is doubted in view of limited British producing facilities. In tin plate, for example, producing capacity in Britain is believed sufficient to care only for pressing home requirements and the country's normal export trade. Exports of manufactured hard goods have been restricted for some time and thus cannot fall as far as they might had the outward movement been unrestricted and large. Furthermore, some foreign requirements can be satisfied only in the U. S.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Sept. 24	Change	Same Week 1948	Same Week 1947
Pittsburgh	83.5	+ 1.5*	93.5	98.5
Chicago	94	+ 0.5*	96.5	94
Eastern Pa.	80	None	93	92
Youngstown	94	— 1	103	92
Wheeling	99.5	+ 1.5	93.5	89
Cleveland	98.5	+ 0.5*	97	90.5
Buffalo	79.5	— 19	104	88.5
Birmingham	100	None	100	99
New England	68	— 6	83	83
Cincinnati	96	None	102	94
St. Louis	80	— 9.5	91.5	78
Detroit	104	+ 4*	105	94
Western	80	+ 4	..	..
Estimated national rate	86	— 0.5	96	94

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. *From revised rate.

Composite Market Averages

	Sept. 22 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEXES, Weighted:					
Index (1935-39 av.=100)	152.52	152.52	152.52	151.86	99.16
Index, cents per pound..	4.132	4.132	4.132	4.114	2.686
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT.....	$91.55	$91.55	$91.55	$95.05	$56.73
No. 2 Fdry Pig Iron, GT	46.10	46.10	46.10	45.13	23.67
Malleable Pig Iron, GT..	47.27	47.27	47.27	45.63	24.29
Basic Pig Iron, GT.....	45.60	45.60	45.60	44.94	23.00
Steelmaking Scrap, GT..	27.08	26.92	21.92	43.33	17.41

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Sept. 22 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pitts.	3.35	3.35	3.35	3.45	2.15
Bars, H.R., del. Phila. ...	3.83	3.83	3.8164	3.79	2.47
Bars, H.R., Chicago	3.35	3.35	3.35	3.35	2.15
Bars, C.F., Pitts.	3.95-4.00	3.95-4.00	3.95-4.00	3.95-4.25	2.65
Bars, C.F., Chicago	4.00	4.00	4.00	4.00	2.65
Shapes, Std., Pitts.	3.25	3.25	3.25	3.25	2.10
Shapes, Std., Chicago	3.25	3.25	3.25	3.25	2.10
Shapes, del. Phila.	3.50	3.50	3.4918	3.48	2.215
Plates, Pittsburgh	3.40	3.40	3.40	3.40-3.60	2.10
Plates, Chicago	3.40	3.40	3.40	3.40	2.10
Plates, Coatesville, Pa. ..	3.50	3.50	3.50	3.75	2.10
Plates, Sparrows Point, Md.	3.40	3.40	3.40	3.45	2.10
Plates, Claymont, Del.	3.50	3.50	3.50	3.95	2.10
Plates, del. Phila.	3.59	3.59	3.5848	3.71	2.15
Sheets, H.R., Pitts.	3.25	3.25	3.25	3.25-3.30	2.10
Sheets, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Sheets, C.R., Pitts.	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Chicago	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Detroit	4.20	4.20	4.20	4.20	3.15
Sheets, Galv., Pitts.	4.40	4.40	4.40	4.40	3.50
Strip, H.R., Pitts.	3.25	3.25	3.25	3.25-3.30	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25-3.30	2.10
Strip, C.R., Pitts.	4.00	4.00	4.00	4.00	2.80
Strip, C.R., Chicago	4.00–15	4.00–15	4.00–15	4.00–25	2.90
Strip, C.R., Detroit	4.20–25	4.20–25	4.20–25	4.20	2.90
Wire, Basic, Pitts.	4.15	4.15	4.15	4.15	2.60
Nails, Wire, Pitts.	5.15	5.15	5.15	5.20	2.55
Tin plate, box, Pitts.	$7.75	$7.75	$7.75	$6.80	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$61.00	$61.00	$61.00	$61.00	$40.00
Wire rods, $\frac{7}{32}$-⅜", Pitts. ..	3.40	3.40	3.40	3.40	2.00

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$45.50	$24.50
Basic, Valley	46.00	46.00	46.00	43.00	23.50
Basic, del. Phila.	49.44	49.44	49.39	50.17	25.34
No. 2 Fdry, Pitts.	46.50	46.50	46.50	45.00	24.00
No. 2 Fdry, Chicago	46.50	46.50	46.50	43.25	24.00
No. 2 Fdry, Valley	46.50	46.50	46.50	43.50	24.00
No. 2 Fdry, del. Phila. ...	49.94	49.94	49.89	50.67	25.46
No. 2 Fdry, Birmingham ..	39.38	39.38	39.38	43.38	20.38
Malleable, Valley	46.50	46.50	46.50	43.50	24.00
Malleable, Chicago	46.50	46.50	46.50	43.50	24.00
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	62.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	148.00	135.00

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts. ..	$29.75	$29.75	$23.00	$42.75	$17.75
No. 1 Heavy Melt. E. Pa..	25.00	24.50	20.25	45.50	15.75
No. 1 Heavy Melt. Chicago	26.50	26.50	22.50	41.75	18.75
No. 1 Heavy Melt. Valley..	31.25	29.50	23.75	42.75	20.00
No. 1 Heavy Melt. Cleve...	26.50	25.00	20.00	42.25	17.50
No. 1 Heavy Melt. Buffalo.	28.25	26.25	24.25	48.25	17.50
Rails, Rerolling, Chicago..	41.50	41.50	34.50	64.50	22.25
No. 1 Cast, Chicago.....	41.50	41.50	39.00	70.50	20.00

COKE, Gross Ton

Beehive, Furn., Connlsvl. .	$13.25	$13.25	$13.25	$14.50	$7.00
Beehive, Fdry., Connlsvl. .	15.75	15.75	15.75	17.00	7.75
Oven, Fdry, Chicago	20.00	20.00	20.00	20.40	13.35

NONFERROUS METALS

Copper, del. Conn.	17.625	17.625	17.625	23.50	12.00
Zinc, E. St. Louis	10.00	10.00	11.00	15.00	8.25
Lead, St. Louis	14.925	14.925	14.925	19.30–35	6.35
Tin, New York	103.00	103.00	103.00	103.00	52.00
Aluminum, del.	17.00	17.00	17.00	16.50	15.00
Antimony, Laredo, Tex. ..	38.50	38.50	38.50	35.00	14.50
Nickel, refinery, duty paid	40.00	40.00	40.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malle-able	Besse-mer
Bethlehem,Pa. B2	$48.00	$48.50	$49.00	$49.50
Newark,del.	50.63	51.13	51.13	52.13
Brooklyn,N.Y.,del.	....	52.79	53.29	....
Birmingham District				
Birmingham,Ala. R2, S9	38.88	39.38	....	....
Woodward,Ala. W15	38.88	39.38	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda,N.Y. W12	46.00	46.50	47.00	....
N.Tonawanda,N.Y. T9	....	46.50	47.00	....
Boston, del.	55.26	55.76	56.20	....
Rochester,N.Y., del.	48.63	49.13	49.63	....
Syracuse,N.Y., del	49.58	50.08	50.58	....
Chicago District				
Chicago I3	46.00	46.50	46.50	47.00
Gary,Ind. C3	46.00	....	46.50	....
IndianaHarbor,Ind. I2	46.00	....	46.50	....
So.Chicago,Ill. W14	46.00	46.50	46.50	....
So.Chicago,Ill. C3	46.00	....	46.50	47.00
So.Chicago,Ill. Y1	46.00	46.50	46.50	....
Milwaukee,del.	47.89	48.39	48.39	48.89
Muskegon,Mich.del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Lorain,O. N3	46.00	....	....	47.00
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Duluth I3	....	....	46.50	....
Erie,Pa. I3	46.00	46.50	46.50	47.00
Everett,Mass. E1	....	50.00	50.50	....
Geneva,Utah G1	46.00	46.50	....	....
Seattle,Tacoma,Wash.,del.	....	54.20	....	....
Portland,Oreg.,del.	....	54.20	....	....
LosAngeles,SanFrancisco,del.	53.70	54.20	....	....
GraniteCity,Ill. M10	47.90	48.40	48.90	....
St.Louis,del.(incl. tax)	48.65	49.15	49.65	....
Ironton,Utah C11	46.00	46.50	....	....
LoneStar,Tex. L6	46.00	*46.50	....	....
Gulf ports, del.	50.50	51.00	....	....
Minnequa,Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
NevilleIsland,Pa. P6	46.00	46.50	46.50	47.00
Pitts. N&S sides, Ambridge, Aliquippa, del.	47.19	47.69	47.69	48.19
McKeesRocks,del.	46.95	47.45	47.45	47.95
Lawrenceville, Homestead, McKeesport, Monaca, del. ...	47.44	47.94	47.94	48.44
Verona,del.	47.90	48.40	48.40	48.90
Brackenridge,del.	48.13	48.63	48.63	49.13
Bessemer,Pa. C3	46.00	....	46.50	47.00
Clairton,Rankin,So.Duquesne,Pa. C3	46.00	....	....	....
McKeesport,Pa. N3	46.00	....	....	47.00
Sharpsville,Pa. S6	46.00	46.50	46.50	47.00
Steelton,Pa. B2	48.00	48.50	49.00	49.50
Steubenville,O. W10	46.00	....	....	....
Struthers,O. S16	46.00	....	....	....
Swedeland,Pa. A3	48.00	48.50	49.00	49.50
Philadelphia,del.	49.44	49.94	50.44	50.94
Toledo,O. I3	46.00	46.50	46.50	47.00
Cincinnati,del.	51.01	51.51	....	....
Troy,N.Y. R2	48.00	48.50	49.00	....
Youngstown District				
Hubbard,O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield,O.,del.	50.26	50.76	50.76	51.26

* Low phos, Southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorous: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; Add $1 for each 0.5% Si to 11.50%)

Jackson,O. J1, G2	$59.50
Buffalo H1	60.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls,N.Y. P15	$71.50
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk, Iowa, OH & Fdry, 12½ lb, piglets, frt. allowed K2	82.00
Wenatchee, Wash. OH & Fdry, frt. allowed K2.....	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton,Pa. B2	54.00
Philadelphia delivered	56.9786
Troy,N.Y. R2	54.00

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Semifinished and Finished Steel Products

Closing prices Sept. 22, 1949; cents per lb. unless otherwise noted. Code numbers following mill points indicate producing company, key on next page.

INGOTS, Carbon, Forging (NT)
Detroit R7 .....$50.00
Munhall,Pa. C3 ..... 50.00

INGOTS, Alloy (NT)
Detroit R7 .....$51.00
Houston,Tex. S5 ..... 51.00
Midland,Pa. C18 ..... 51.00
Munhall,Pa. C3 ..... 51.00
So.Duquesne,Pa. C3 .. 51.00

BILLETS, BLOOMS & SLABS, Carbon, Rerolling (NT)
Bessemer,Pa. C3 .....$52.00
Clairton,Pa. C3 ..... 52.00
Conshohocken,Pa. A3 . 57.00
Ensley,Ala. T2 ..... 52.00
Fairfield,Ala. T2 ..... 52.00
Fontana,Calif. K1 ... 71.00
Gary,Ind. C3 ..... 52.00
Johnstown,Pa. B2 ... 52.00
Lackawanna,N.Y. B2 . 52.00
Munhall,Pa. C3 ..... 52.00
So.Chicago,Ill. C3 .. 52.00
So.Duquesne,Pa. C3 .. 52.00

BILLETS, BLOOMS & SLABS, Carbon, Forging (NT)
Bessemer,Pa. C3 .....$61.00
Buffalo R2 ..... 61.00
Canton,O. R2 ..... 61.00
Clairton,Pa. C3 ..... 61.00
Cleveland R2 ..... 61.00
Conshohocken,Pa. A3 . 63.00
Detroit R7 ..... 61.00
Ensley,Ala. T2 ..... 61.00
Fairfield,Ala. T2 ..... 61.00
Fontana,Calif. K1 ... 80.00
Gary,Ind. C3 ..... 61.00
Geneva,Utah G1 ..... 61.00
Houston,Tex. S5 ..... 69.00
Ind.Harbor,Ind. I2 .. 61.00
Johnstown,Pa. B2 ... 61.00
Lackawanna B2 ..... 61.00
Munhall,Pa. C3 ..... 61.00
So.Duquesne,Pa. C3 .. 61.00
So.Chicago,Ill. C3, R2 61.00
Warren,O. C17 ..... 61.00

BILLETS, BLOOMS & SLABS, Alloy (NT)
Bethlehem,Pa. B2 ...$63.00
Buffalo R2 ..... 63.00
Canton,O. R2, T7 .... 63.00
Conshohocken,Pa. A3 . 65.00
Detroit R7 ..... 63.00
Fontana,Calif. K1 ... 82.00
Gary,Ind. C3 ..... 63.00
Houston,Tex. S5 ..... 71.00
Johnstown,Pa. B2 ... 63.00
Lackawanna,N.Y. B2 . 63.00
Massillon,O. R2 ..... 63.00
Midland,Pa. C18 ..... 63.00
Munhall,Pa. C3 ..... 63.00
So.Chicago,Ill. C3, R2 63.00
So.Duquesne,Pa. C3 . 63.00

SHEET BARS (GT)
Mansfield,O. E6 .....$60.00
Portsmouth,O P12 .. 52.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$76.00
Cleveland R2 ..... 76.00
Ind.Harbor,Ind. I2 ... 76.00
Massillon,O. R2 ..... 76.00
So.Chicago,Ill. R2 ... 76.00

SKELP
Aliquippa,Pa. J5 ..... 3.25
Munhall,Pa. C3 ..... 3.25
Warren,O. R2 ..... 3.25
Youngstown C3, R2 .. 3.25

WIRE RODS
AlabamaCity,Ala. R2 ..3.40
Cleveland A7 .....3.40
Donora,Pa. A7 .....3.40
Fairfield,Ala. T2 .....3.40
Houston,Tex. S5 .....3.95
Ind.Harbor,Ind. Y1 ....3.40
Johnstown,Pa. B2 .....3.40
Joliet,Ill. A7 .....3.40
LosAngeles B3 .....4.20
Monessen,Pa. P7 .....3.40
Pittsburg,Calif. C11 ...4.05
Portsmouth,O. P12 .....3.40
So.Chicago,Ill. R2 .....3.40
SparrowsPoint B2 .....3.50
Sterling,Ill.(1) N15 .....3.40
Struthers,O. Y1 .....3.40
Torrance,Calif. C11 ....4.20
Worcester,Mass. A7 ....3.70

STRUCTURALS, Wide Flange
Bethlehem,Pa. B2 .....3.30
Lackawanna,N.Y. B2 ..3.30
Munhall,Pa. C3 .....3.20
So.Chicago,Ill. C3 .....3.20

STRUCTURALS, H.-S. Low-Alloy
Aliquippa,Pa. J5 .....4.95
Bessemer,Ala. T2 .....4.95
Bethlehem,Pa.(14) B2 .5.05
Clairton,Pa. C3 .....4.95
Fairfield,Ala. T2 .....4.95
Fontana,Calif. K1 .....6.10
Gary,Ind. C3 .....4.95
Ind.Harbor,Ind. I2, Y1 ..4.95
Johnstown,Pa. B2 .....5.05
Lackawanna B2 .....5.05
Munhall,Pa.(14) C3 ....4.95
So.Chicago,Ill.(14) C3 ..4.95
Struthers,O. Y1 .....4.95

STRUCTURALS, Carbon Steel Standard Shapes
Aliquippa,Pa. J5 .....3.25
Bessemer,Ala. T2 .....3.25
Bethlehem,Pa. B2 .....3.30
Clairton,Pa. C3 .....3.25
Fairfield,Ala. T2 .....3.25
Fontana,Calif. K1 .....3.80
Gary,Ind. C3 .....3.25
Geneva,Utah G1 .....3.25
Houston,Tex. S5 .....3.65
Ind.Harbor,Ind. I2 .....3.25
Johnstown,Pa. B2 .....3.30
KansasCity,Mo. S5 ....3.85
Lackawanna B2 .....3.30
LosAngeles B3 .....3.85
Minnequa,Colo. C10 ....3.75
Munhall,Pa. C3 .....3.25
Niles,Calif.(22) P1 ....3.97
Seattle B3 .....3.90
So.Chicago,Ill. C3, W14 .3.25
So.SanFrancisco B3 ....3.80
Torrance,Calif. C11 ....3.85
Weirton,W.Va. W6 .....3.25

STRUCTURALS, Alloy Standard Shapes
Clairton,Pa. C3 .....4.05
Fontana,Calif. K1 .....5.25
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 .....4.05

SHEET STEEL PILING
Ind.Harbor,Ind. I2 .....4.05
Lackawanna B2 .....4.05
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 .....4.05
Weirton,W.Va. W6 .....4.05

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ...3.40
Aliquippa,Pa. J5 .....3.40
Ashland,Ky.(15) A10 ...3.40
Bessemer,Ala. T2 .....3.40
Clairton,Pa. C3 .....3.40
Claymont,Del. W16 ....3.50
Cleveland J5, R2 .....3.40
Coatesville,Pa. L7 .....3.50
Conshohocken,Pa. A3 ...3.50
Ecorse,Mich. G5 .....3.65
Fairfield,Ala. T2 .....3.40
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.40
Geneva,Utah G1 .....3.40
Harrisburg,Pa. C5 .....3.50
Houston,Tex. S5 .....3.80
Ind.Harbor,Ind. I2, Y1 ..3.40
Johnstown,Pa. B2 .....3.40
Lackawanna B2 .....3.40
Minnequa,Colo. C10 ....4.30
Munhall,Pa. C3 .....3.40
Pittsburgh J5 .....3.40
Seattle B3 .....4.30
Sharon,Pa. S3 .....3.40
So.Chicago,Ill. C3, W14 .3.40
SparrowsPoint,Md. B2 ..3.40
Steubenville,O. W10 ....3.40
Warren,O. R2 .....3.40
Weirton,W.Va. W6 .....3.40
Youngstown C3, Y1 ....3.40

PLATES (Universal Mill)
Fontana,Calif. K1 .....4.30

PLATES, Open-Hearth Alloy
Coatesville,Pa. L7 .....4.50
Conshohocken,Pa. A3 ...4.40
Fontana,Calif. K1 .....5.40
Gary,Ind. C3 .....4.40
Johnstown,Pa. B2 .....4.40
Munhall,Pa. C3 .....4.40
So.Chicago,Ill. C3 .....4.40
SparrowsPoint,Md. B2 ..4.40

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.20
Bessemer,Ala. T2 .....5.20
Clairton,Pa. C3 .....5.20
Cleveland J5, R2 .....5.20
Conshohocken,Pa. A3 ...5.20
Ecorse,Mich. G5 .....5.45
Fairfield Ala. T2 .....5.20
Fontana,Calif. K1 .....5.80
Gary,Ind. C3 .....5.20
Geneva,Utah G1 .....5.20
Houston,Tex. S5 .....5.60
Ind.Harbor,Ind. I2, Y1 ..5.20
Johnstown,Pa. B2 .....5.20
Munhall,Pa. C3 .....5.20
Pittsburgh J5 .....5.20
Sharon,Pa. S3 .....5.65
So.Chicago,Ill. C3 .....5.20
SparrowsPoint,Md. B2 ..5.20
Warren,O. R2 .....5.20
Youngstown Y1 .....5.20

PLATES, Ingot Iron
Ashland,cl(15) A10 ....3.65
Ashland,lcl(15) A10 ....4.15
Cleve.Carlot R2 .....3.65
Warren,Carlot R2 .....3.65

PLATES, Wrought Iron
Economy,Pa. B14 .....7.85

FLOOR PLATES
Cleveland J5 .....4.55
Conshohocken,Pa. A3 ...4.55
Harrisburg,Pa. C5 .....4.55
Ind.Harbor,Ind. I2 .....4.55
Munhall,Pa. C3 .....4.55
So.Chicago,Ill. C3 .....4.55

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ...3.35
Aliquippa,Pa. J5 .....3.35
Alton,Ill.(1) L1 .....3.35
Ashland,Ky.(17) A10 ..3.35
Atlanta,Ga. A11 .....3.50
Bessemer,Ala. T2 .....3.35
Buffalo R2 .....3.35
Canton,O. R2 .....3.35
Clairton,Pa. C3 .....3.35
Cleveland R2 .....3.35
Ecorse,Mich. G5 .....3.55
Emeryville,Calif. J7 ....4.10
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.35
Houston,Tex. S5 .....3.75
Ind.Harbor,Ind. I2, Y1..3.35
Johnstown,Pa. B2 .....3.35
KansasCity,Mo. S5 .....3.95
Lackawanna,N.Y. B2 ...3.35
LosAngeles B3 .....4.05
Midland,Pa. C18 .....3.35
Milton,Pa. B6 .....3.35
Minnequa,Colo. C10 ....3.85
Niles,Calif. P1 .....4.05
N.Tonawanda,N.Y. B11.3.35
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Portland,Oreg. O4 .....4.10
Seattle B3, N14 .....4.10
S.Chicago C3, R2, W14..3.35
So.Duquesne,Pa. C3 ....3.35
S.SanFran.,Cal. B3 ....4.10
Struthers,O. Y1 .....3.35
Torrance,Calif. C11 ....4.05
Weirton,W.Va. W6 .....3.35
Youngstown C3, R2 ....3.35

BARS, Cold-Finished Carbon
Aliquippa,Pa. K5 .....4.00
Ambridge,Pa. W18 .....4.00
BeaverFalls,Pa. M12, R2...4.00
Buffalo B5 .....4.00
Camden,N.J. P13 .....4.48
Carnegie,Pa. C12 .....4.00
Chicago W18 .....4.00
Cleveland A7, C20 .....4.00
Cumberland,Md. C19 ...3.95
Donora,Pa. A7 .....4.00
Ecorse,Mich. G5 .....4.30
Elyria,O. W8 .....4.00
FranklinPark,Ill. N5 ...4.00
Gary,Ind. R2 .....4.00
Hammond,Ind. L2, M13..4.00
Hartford,Conn. R2 ....4.40
Harvey,Ill. B5 .....4.00
Indianapolis M13 .....4.20
LosAngeles R2 .....5.40
Mansfield,Mass. B5 ....4.40
Massillon,O. R2 .....4.00
Midland,Pa. C18 .....4.00
Monaca,Pa. S17 .....4.00
Newark,N.J. W18 .....4.40
Plymouth,Mich. P5 ....4.25
Pittsburgh J5 .....3.95
Putnam,Conn. W18 ....4.40
Readville,Mass. C14 ....4.40
St.Louis,Mo. M5 .....4.35
So.Chicago,Ill. W14 ....4.00
SpringCity,Pa.(5) K3 ..4.48
Struthers,O. Y1 .....4.00
Waukegan,Ill. A7 .....4.00
Youngstown F3, Y1 ....4.00

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.35
Atlanta,Ga. A11 .....3.50
Bethlehem,Pa.(2) B2 ..3.55
Johnstown,Pa. B2 .....3.35
Lackawanna,N.Y. B2 ..3.35
Niles,Calif. P1 .....4.05
Pittsburgh(23) J5 .....3.35
Portland,Oreg. O4 .....3.90
SanFrancisco S7 .....4.05
Weirton,W.Va. W6 .....3.35

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. C3 .....4.00
Fontana,Calif. K1 .....4.75
Gary,Ind. C3 .....4.00
Youngstown C3 .....4.00

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .. ....5.10
Bessemer,Ala. T2 .....5.10
Bethlehem,Pa. B2 .....5.10
Clairton,Pa. C3 .....5.10
Cleveland R2 .....5.10
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.10
Fontana,Calif. K1 .....6.15
Gary,Ind. C3 .....5.10
Ind.Harbor,Ind. I2, Y1..5.10
Johnstown,Pa. B2 .....5.10
Lackawanna B2 .....5.10
Pittsburgh J5 .....5.10
So.Duquesne,Pa. C3 ....5.10
Struthers,O. Y1 .....5.10
Youngstown C3 .....5.10

BARS, Wrought Iron
Economy,Pa.(S.R.) B14 9.50
Economy,Pa.(D.R.) B14 11.00
Economy(Stablt) B14 . 11.30
McK.Rks.(S.R.) L5 .. 8.60
McK.Rks.(D.R.) L5 .. 11.25
McK.Rks.(Staybolt) L5 12.75

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....3.75
Buffalo R2 .....3.75
Canton,O. R2, T7 .....3.75
Clairton,Pa. C3 .....3.75
Ecorse,Mich. G5 .....4.05
Fontana,Calif. K1 .....4.75
Gary,Ind. C3 .....3.75
Houston,Tex. S5 .....4.15
Ind.Harbor,Ind. I2, Y1..3.75
Johnstown,Pa. B2 .....3.75
KansasCity,Mo. S5 .....4.35
Lackawanna,N.Y. B2 ...3.75
LosAngeles B3 .....4.80
Massillon,O. R2 .....3.75
Midland,Pa. C18 .....3.75
S.Chicago C3, R2, W14..3.75
So.Duquesne,Pa. C3 ...3.75
Struthers,O. Y1 .....3.75
Warren,O. C17 .....3.75
Youngstown C3 .....3.75

BARS, Cold-Finished Alloy
Aliquippa,Pa. K5 .....4.65
Ambridge,Pa. W18 .....4.65
BeaverFalls,Pa. M12 ...4.65
Bethlehem,Pa. B2 .....4.65
Buffalo B5 .....4.65
Canton,O. R2, T7 .....4.65
Carnegie,Pa. C12 .....4.65
Chicago W18 .....4.65
Cleveland A7, C20 .....4.65
Donora,Pa. A7 .....4.65
Elyria,O. W8 .....4.65
Gary,Ind. R2 .....4.65
Hammond,Ind. L2, M13.4.65
Hartford,Conn. R2 .....4.95
Harvey,Ill. B5 .....4.65
Indianapolis M13 .....4.85
Lackawanna,N.Y. B2 ..4.65
Mansfield,Mass. B5 ....4.95
Massillon,O. R2 .....4.65
Midland,Pa. C18 .....4.65
Monaca,Pa. S17 .....4.65
Newark,N.J. W18 .....4.95
So.Chicago,Ill. R2, W14.4.65
Struthers,O. Y1 .....4.65
Waukegan,Ill. A7 .....4.65
Worcester,Mass. A7 ....4.95
Youngstown F3, Y1 ....4.65

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ...3.35
Alton,Ill.(6) L1 .....3.35
Atlanta,Ga.(7) A11 ....3.50
Buffalo R2 .....3.35
Cleveland R2 .....3.35
Emeryville,Calif. J7 ....4.10
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 .....4.90
Ft.Worth,Tex.(7) T4 ....4.33
Gary,Ind. C3 .....3.35
Houston,Tex. S5 .....3.75
Ind.Harbor,Ind. I2, Y1..3.35
Johnstown,Pa. B2 .....3.35
KansasCity,Mo. S5 .....3.95
Lackawanna B2 .....3.35
LosAngeles B3 .....4.05
Minnequa,Colo. C10 ....4.25
Niles,Calif. P1 .....4.05
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Portland,Oreg O4 .....4.10
Seattle,Wash. B3, N14..4.10
Youngstown C3, R2 .....3.35
So.Chicago,Ill. R2 .....3.35
So.Duquesne,Pa. C3 ....3.35
So.SanFrancisco B3 ....4.10
SparrowsPoint,Md. B2 ..3.35
Struthers,O. Y1 .....3.35
Torrance,Calif. C11 ....4.05
Youngstown C3, R2 ....3.35

BARS, Reinforcing (Fabricated; to Consumers)
Ft.Worth,Tex.(7) T4 ...4.83
Johnstown,¼-1" B2 ....4.25
LosAngeles B3 .....5.00
Pittsburgh J5 .....4.25
Seattle B3, N14 .....5.00
So.SanFrancisco B3 ....5.00
SparrowsPt.,1⅛-1¼" B2.4.83
SparrowsPt.,¼-1" B2 ..4.25

RAIL STEEL BARS
ChicagoHts.,Ill.(3) J2 ..3.25
Hntngtn.W.Va.(3,4) W7..3.35
Moline,Ill.(3) R2 .....3.35
Williamsport(2,3) S19 ..3.35
Williamsport(4) S19 ....3.85

BARS, Hot-Rolled Ingot Iron
Ashland,Ky.(17) A10 ..3.60

SHEETS, Cold-Rolled, High-Strength Low-Alloy
Cleveland J5, R2 .....6.05
Ecorse,Mich. G5 .....6.25
Fontana,Calif. K1 .....6.95
Gary,Ind. C3 .....6.05
Ind.Harbor,Ind. I2, Y1 ..6.05
Irvin,Pa. C3 .....6.05
Lackawanna B2 .....6.05
Pittsburgh J5 .....6.05
SparrowsPoint,Md. B2 ..6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 .....6.05
Youngstown Y1 .....6.05

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.25
Ashland,Ky.(8) A10 ...3.25
Butler,Pa. A10 .....3.25
Cleveland J5, R2 .....3.25
Conshohocken,Pa. A3 ..3.35
Ecorse,Mich.(8) G5 ....3.45
Fairfield,Ala. T2 .....3.25
Fontana,Calif. K1 .....4.15
Gary,Ind. C3 .....3.25
Ind.Harbor,Ind. I2, Y1 ..3.25
Irvin,Pa. C3 .....3.25
KansasCity,Mo. S5 .....6.25
Kokomo,Ind. C16 .....3.35
Lackawanna B2 .....3.25
Munhall,Pa. C3 .....3.25
Pittsburg,Calif. C11 ....3.95
Pittsburgh J5 .....3.25
Sharon,Pa. S3 .....3.25
So.Chicago,Ill. W14 ....3.25
SparrowsPoint,Md. B2 ..3.25
Steubenville,O. W10 ....3.25
Torrance,Calif. C11 ....3.95
Warren,O. R2 .....3.25
Weirton,W.Va. W6 .....3.25
Youngstown C3, Y1 ....3.25

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity,Ala. R2 ..4.40
Dover,O. R1 .....5.00
Fairfield,Ala. T2 .....4.15
Ind.Harbor,Ind. I2 .....4.15
Kokomo,Ind. C16 .....4.25
Mansfield,O. E5 .....4.15
Niles,O. N12, M4 .....4.15
Torrance,Calif. C11 ....5.05

SHEETS, Cold-Rolled Steel (Commercial Quality)
Butler,Pa. A10 .....4.00
Cleveland J5, R2 .....4.00
Ecorse,Mich. G5 .....4.20
Fairfield,Ala. T2 .....4.00
Follansbee,W.Va. F4 ....4.00
Fontana,Calif. K1 .....4.90
Gary,Ind. C3 .....4.00
GraniteCity,Ill. G4 ....4.20
Ind.Harbor,Ind. I2, Y1 ..4.00
Irvin,Pa. C3 .....4.00
Lackawanna B2 .....4.00
Middletown,O. A10 .....4.00
Pittsburg,Calif. C11 ....4.95
Pittsburgh J5 .....4.00
SparrowsPoint,Md. B2 ..4.00
Steubenville,O. W10 ....4.00
Warren,O. R2 .....4.00
Weirton,W.Va. W6 .....4.00
Youngstown Y1 .....4.00

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....4.95
Conshohocken,Pa. A3 ...4.95
Ecorse,Mich. G5 .....5.15
Fairfield,Ala. T2 .....4.95
Fontana,Calif. K1 .....6.64
Gary,Ind. C3 .....4.95
Ind.Harbor,Ind. I2, Y1 ..4.95
Irvin,Pa. C3 .....4.95
Lackawanna B2 .....4.95
Pittsburgh J5 .....4.95
So.Chicago,Ill. C3 ....4.95
SparrowsPoint,Md. B2 ..4.95
Warren,O. R2 .....4.95
Weirton,W.Va. W6 .....4.95
Youngstown C3, Y1.....4.95

SHEETS, Gal'zd No. 10 Steel
AlabamaCity,Ala. R2 ...4.40
Ashland,Ky.(8) A10 ...4.40
Canton,O. R2 .....4.40
Dover,O. R1 .....5.40
Fairfield,Ala. T2 .....4.40
Gary,Ind. C3 .....4.40
GraniteCity,Ill. G4 .....4.60
Ind.Harbor,Ind. I2 .....4.40
Irvin,Pa. C3 .....4.40
Kokomo,Ind. C16 .....4.50
MartinsFerry,O. W10 ...4.40
Niles,O. N12 .....4.40
Pittsburg,Calif. C11 ....5.15
SparrowsPoint,Md. B2 ..4.40
Steubenville,O. W10 ....4.40
Torrance,Calif. C11 ....5.15
Weirton,W.Va. W6 .....4.40

SHEETS, Galvanized No. 10, High-Strength Low-Alloy
Irvin,Pa. C3 .....6.75
SparrowsPoint,Md. B2 ..6.75

SHEETS, Galvannealed Steel
Canton,O. R2 .....4.95
Irvin,Pa. C3 .....4.95
Kokomo,Ind. C16 .....5.05
Niles,O. N12 .....4.95

SHEETS, Zincgrip No. 10
Butler,Pa. A10 .....4.65
Middletown,O. A10 .....4.65

SHEETS, Electro Galvanized
Cleveland R2 .....5.15
Niles,O. R2 .....5.15
Weirton,W.Va. W6 .....5.00

SHEETS, Zinc Alloy
Ind.Harbor,Ind. I2 .....5.05

SHEETS, Aluminized
Butler,Pa. A10 .....7.75

SHEETS, Culvert, No. 16 Flat

	Cu Alloy	Cu FE
Ashland A10	5 00	...
Fairfield,Ala. T2	...	5.00
Gary C3	5.00	5.35
GraniteCity G4	5.40	5.70
Irvin C3	5 00	5.35
Kokomo C16	5.40	...
MartinsFy.O. W10	5.00	5.35
Pittsburg,Cal. C11	5.75	...
SparrowsPt. B2	5.00	...
Torrance,Cal. C11	5 75	...

SHEETS, Culvert, No. 16 Flat Ingot Iron

Ashland,Ky. A10	5.25

SHEETS, Well Casing

Torrance,Calif. C11	4.75
Youngstown C3	3.75

SHEETS, Long Terne, Steel (No. 10; Commercial Quality)

BeechBotm.,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Weirton,W.Va. W6	4.80

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.75
Gary,Ind. C3	6.65
Ind.Harbor,Ind. I2	6.65
Irvin,Pa. C3	6.65
Weirton,W.Va. W6	6.65
Yorkville,O. W10	6.65

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.20
Gary,Ind. C3	8.10

SHEETS, Mfg. Ternes, 8 lb

Yorkville,O. W.10	$8.10

SHEETS, Coated Ternes, 12 lb

Yorkville,O. W10	8.95

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.50
Cleveland R2	3.85
Ind.Harbor,Ind. I2	3.50
Warren,O. R2	3.85

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.60
Middletown,O. A10	4.50
Warren,O. R2	4.60

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I2	4.95

SHEETS, Zincgrip No. 10 Flat, Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.00
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Harrison,N.J. C18	9.80
NewBritn,Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	9.50
Worcester,Mass. A7	9.80
Youngstown C8	9.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enam'lg. Iron, No. 12

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Niles,O. M4	4.40
Youngstown Y1	4.40

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.75
Fairfield,Ala. T2	5.85
Gary,Ind. C3	5.75
GraniteCity,Ill. G4	5.95
Ind.Harbor,Ind. I2, Y1	5.75
Irvin,Pa. C3	5.75
Niles,O. R2	5.75
Pittsburg,Calif. C11	6.50
SparrowsPoint,Md. B2	5.85
Warren,O. R2	5.75
Weirton,W.Va. W6	5.75
Yorkville,O. W10	5.75

TIN PLATE, American 1.25 lb Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$7.50	$7.75
Fairfield,Ala. T2	7.60	7.85
Gary C3	7.50	7.75
Gran.City.,Ill G4	7.70	7.95
Ind.Harb. I2, Y1	7.50	7.75
Irvin,Pa. C3	7.50	7.75
Pitts.,Cal. C11	8.25	8.50
Sp.Pt.,Md. B2	7.60	7.85
Warren R2	7.50	7.75
Weirton W6	7.50	7.75
Yorkville,O. W10	7.50	7.75

TIN PLATE, Electrolytic (Base Box)

	0.25 lb.	0.50 lb.	0.75 lb.
Aliquippa,Pa. J5	$6.45	$6.70	$7.00
Fairfield,Ala. T2	6.55	6.80	7.10
Gary,Ill. C3	6.45	6.70	7.00
GraniteCity,Ill. G4	6.65	6.90	7.20
Ind.Harbor,Ind. I2, Y1	6.45	6.70	7.00
Irvin,Pa. C3	6.45	6.70	7.00
Niles,O. R2	6.45	6.70	7.00
Pittsburg,Calif. C11	7 20	7.45	7.75
SparrowsPoint,Md. B2	6.55	6.80	7.10
Weirton,W.Va. W6	6.45	6.70	7.00
Yorkville,O. W10	6.45	6.70	7.00

SHEETS SILICON, (24 Gage Base)

	Field	Arm.	Elec.	Motor	Dyn.
BeechBottom,W.Va. W10	...	5.45	5.95	6.70	7.50
Brackenridge,Pa. A4	...	...	5.95	6.70	7.50
Follansbee,W.Va. F4	...	5.45	5.95	6.70	7.50
GraniteCity,Ill. G4	...	...	6.15	6.90	7.70
Ind.Harbor,Ind. I2	5.15	5.45	5.95	...	...
Mansfield,O. E6	5.15	5.45	5.95	...	...
Niles,O. M4	5.15	5.45	5.95	...	...
Niles,O. N12	...	5.45	5.95	...	...
Toronto,O. F4	...	5.45	5.95	6.70	7.50
Vandergrift,Pa. C3	...	5.45	5.95	6.70	7.50
Warren,O. R2	...	5.45	5.95	6.70	...
Zanesville,O. A10	...	5.45	5.95	6.70	7.50

COILS AND CUT LENGTHS, Cold-Rolled, Silicon

	Field	Arm.	Elec.	Motor	Dyn.
Vandergrift,Pa. C3	...	5.70	6.20	6.95	7.75
Warren,O. R2	5.40	5.70	6.20	6.95	7.75

SHEETS, Silicon Transformer Grade

	72	65	58	52
BeechBottom,W.Va. W10	8.05	8.60	9.30	10.10
Brackenridge,Pa. A4	8.05	8.60	9.30	....
Follansbee,W.Va. F4	8.05	8.60	9.30	10.10
Toronto,O. F4	8.05	8.60	9.30	10.10
Vandergrift,Pa. C3	8.05	8.60	9.30	10.10
Zanesville,O. A10	8.05	8.60	9.30	10.10

COLD-REDUCED COILS and Cut Lengths, Silicon

	72	T-100	T-90	T-80
Butler,Pa. A10	...	12.35	13.60	14.85
Vandergrift,Pa. C3	8.30	11.35	12.60	13.85
Warren,O. R2	8.30	....	....	....

STRIP, Hot-Rolled Carbon

Alton,Ill.(1) L1	3.25
Ashland,Ky. A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.25
Cleveland J5	3.25
Detroit M1	3.45
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.25
N.Tonawanda,N.Y. B11	3.30
Pittsburg,Calif. C11	4.00
Pittsburgh J5	3.25
RiverdaleSta.,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.25
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Carbon

Berea,O. C7	6.10
Bridgeprt,Conn.(10) S15	4.00
Butler,Pa. A10	4.00
Chicago,Ill. T6	4.15
Cleveland A7, J5	4.00
Detroit D2, D3	4.25
Detroit M1	4.20
Dover,O. G6	4.00
Ecorse,Mich. G5	4.20
Follansbee,W.Va. F4	4.00
Fontana,Calif. K1	4.90
Ind.Harbor,Ind. I2	4.00
Lackawanna B2	4.00
LosAngeles C1	5.00
Middletown,O. A10	4.00
NewBritain(10) S15	4.00
NewCastle,Pa. B4, E5	4.00
NewHaven,Conn. A7, D2	4.50
NewKensington,Pa. A6	4.00
NewYork W3	5.00
Pawtucket,R.I.(11) N8	4.55
Pawtucket,R.I.(21) N8	4.50
Pawtucket,R.I. R3	4.50
Pittsburgh J5	4.00
RiverdaleSta.,Ill. A1	4.15
Sharon,Pa. S3	4.00
SparrowsPoint,Md. B2	4.00
Trenton,N.J.(13) R5	4.50
Wallingford,Conn. W2	4.50
Warren,O. R2, T5	4.00
Weirton,W.Va. W6	4.00
Youngstown C8, Y1	4.00

STRIP, Cold-Rolled, High-strength Low-Alloy

Cleveland A7, J5	6.05
Ecorse,Mich. G5	6.25
Fontana,Calif. K1	6.95
Lackawanna B2	6.05
Pittsburgh J5	6.05
Sharon,Pa. S3	6.05
SparrowsPoint,Md. B2	6.05
Warren,O. R2	6.05
Weirton,W.Va. W6	6.05
Youngstown Y1	6.05

STRIP, Electro Galvanized

Weirton,W.Va. W6	4.00

TIGHT COOPERAGE HOOP

Atlanta A11	3.60
RiverdaleSta.,Ill. A1	3.60
Sharon,Pa. S3	3.60
Youngstown C3	3.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. A10	3.50
Warren,O. R2	3.85

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.60

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	4.95
Cleveland J5	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Calif. K1	6.64
Gary,Ind. C3	4.95
Houston,Tex. S5	4.95
Ind.Harbor,Ind. I2, Y1	4.95
Lackawanna B2	4.95
Pittsburgh J5	4.95
Sharon,Pa. S3	4.95
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

WIRE, MB Spring, High-Carbon

Aliquippa,Pa J5	5.55
Alton,Ill.(1) L1	5.55
Bartonville,Ill.(19) K4	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen,Pa. P7	5.55
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Trenton,N.J. A7, R5	5.55
Waukegan,Ill. A7	5.55
Worcester A7,J4,T6,W12	5.85

WIRE, Cold-Rolled Flat

Chicago T6	5.35
Cleveland A7	5.00
Kokomo,Ind. C16	5.00
Monessen,Pa. P7	5.00
Pawtucket,R.I.(11) N8	5.55
Pawtucket,R.I.(12) N8	5.50
Trenton,N.J. R5	5.30
Worcester,Mass. A7	5.30
Worcester,Mass. T6	5.30

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(19) K4	7.70
Chicago W13	7.70
Cleveland A7	7.70
Johnstown,Pa. B2	7.70
Kokomo,Ind. C16	7.70
Portsmouth,O. P12	7.70
Struthers,O. Y1	7.70
Trenton,N.J. R5	8.00
Waukegan,Ill. A7	7.70
Worcester,Mass. A7, T6	8.00

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.25-0.40C	0.40-0.60C	0.60-0.80C	0.80-1.05C	1.05-1.35C
Bridgeprt,Conn.(10) S15	4.00	5.50	6.10	8.05	10.35
Bristol,Conn. W1	...	...	6.40	8.35	...
Carnegie,Pa. S18	...	5.50	6.10	8.05	10.35
Chicago T6	4.25	5.65	6.25	8.20	10.50
Cleveland A7	4.00	5.50	6.10	8.05	10.35
Dover,O. G6	4.00	5.50	6.10	7.85	10.15
Harrison,N.J. C18	...	...	6.40	8.35	10.65
Mattapan,Mass. T6	4.50	5.80	6.40	8.35	10.65
NewBritn.,Conn.(19) S15	4.00	5.50	6.10	8.05	10.35
NewCastle,Pa. B4	4.00	5.50	6.10	...	....
NewYork W3	...	5.80	6.40	8.35	10.65
Pawtucket,R.I. N8 Cleve.orPitts.Base	4.55	5.50	6.10	8.05	10.35
Worcester,Mass.Base	4.50	5.80	6.40	8.35	10.65
Trenton,N.J. R5	...	5.80	6.40	8.35	10.65
Union,N.J. H6	4.40	6.35	6.35	8.30	10.50
Wallingford,Conn. W2	4.50	5.80	6.40	8.35	10.65
Weirton,W.Va. W6	4.00	5.50	6.10	8.05	10.35
Worcester,Mass. A7	4.30	5.80	6.40	8.35	10.65
Worcester,Mass. T6	4.50	5.80	6.40	8.35	10.65
Youngstown C8	4.50	5.50	6.10	8.05	10.35

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.15
Aliquippa,Pa J5	4.15
Alton,Ill.(1) L1	4.15
Bartonville,Ill.(1) K4	4.15
Buffalo W12	4.15
Chicago W13	4.15
Cleveland A7, C20	4.15
Crawfrdsvll,Ind. M8	4.30
Donora,Pa. A7	4.15
Duluth A7	4.15
Fairfield,Ala. T2	4.15
Houston,Tex. S5	4.15
Johnstown,Pa. B2	4.15
Joliet,Ill. A7	4.15
KansasCity,Mo. S5	4.75
Kokomo,Ind. C16	4.25
LosAngeles B3	5.10
Millbury,Mass.(12) N6	4.45
Minnequa,Colo. C10	4.50
Monessen, Pa. P7	4.15
Newark,6-8ga. I1	4.75
No.Tonawanda B11	4.15
Palmer,Mass. W12	4.45
Pittsburg,Calif. C11	5.10
Portsmouth,O. P12	4.15
Rankin,Pa. A7	4.15
So.Chicago,Ill. R2	4.15
So.SanFrancisco C10	5.10
SparrowsPoint,Md. B2	4.25
Sterling,Ill.(1) N15	4.15
Struthers,O. Y1	4.15
Torrance,Calif. C11	5.10
Waukegan,Ill. A7	4.15
Worcester,Mass. A7, T6	4.45

WIRE, Merchant Quality (6 to 8 gage)

	An'ld.	Galv.
Ala.City. R2	4.80	5.25
Aliquippa J5	4.80	5.25
Atlanta A11	4.95	5.40
Bartnville.(19) K4	4 80	5.25
Cleveland A7	4.80	5.25
Crawfrdsvll. M8	4.95	5.40
Donora A7	4.80	5.25
Duluth A7	4.80	5.25
Fairfield T2	4.80	5.25
Houston,Tex. S5	5.20	5.65
Johnstown B2	4.80	5.25
Joliet,Ill. A7	4.80	5.25
KansasCity,Mo. S5	5.40	5.85
Kokomo C16	4.90	5.35
LosAngeles B3	5.75	...
Minnequa C10	5.15	5.60
Monessen P7	4.80	5.25
Pitts.Cal. C11	5.75	6.20
Portsmth.(18) P12	4.80	5.25
Rankin A7	4.80	5.25
So.Chicago R2	4.80	5.25
So.S.Fran. C10	5.75	6.20
Sp.Pt. B2	4 90	5.35
Sterling,Ill.(1) N15	4.80	5.25
Struthers,O. Y1	4.80	5.25
Worcester A7	5.10	5.55

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel Co.
B11 Buffalo Bolt Co.
B14 A. M. Byers Co.

C1 Calif. Cold-Rolled Steel
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cld. Roll. Mills Co.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Col. Steel & Shafting Co.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel Co.
D4 Disston & Sons, Henry

E1 Eastrn. Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Co.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F6 Fretz-Moon Tube Co.

G1 Geneva Steel Co.
G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.
H6 Hind Steel Co. Inc

I1 Igoe Bros. Inc.
I2 Inland Steel Co.
I3 Interlake Iron Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J7 Judson Steel Corp.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.

WIRE, Upholstery Spring

	Col.
Aliquippa,Pa. J5	5.20
Alton,Ill.(1) L1	5.20
Cleveland A7	5.20
Donora,Pa. A7	5.20
Duluth A7	5.20
Johnstown,Pa. B2	5.20
LosAngeles B3	6.15
NewHaven,Conn. A7	5.50
Pittsburg,Calif. C11	6.15
Portsmouth,O. P12	5.20
So.Chicago,Ill. R2	5.20
SparrowsPoint,Md. B2	5.30
Struthers,O. Y1	5.20
Torrance,Calif. C11	6.15
Trenton,N.J. A7	5.50
Waukegan,Ill. A7	5.20
Worcester,Mass. A7	5.50

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	123
Aliquippa,Pa. J5	123
Atlanta A11	125
Bartonville,Ill.(19) K4	123
Crawfordsville M8	126
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Houston,Tex. S5	131
Johnstown,Pa. B2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	130
Monessen,Pa. P7	123
Pittsburg,Calif. C11	143
Portsmouth,O.(18) P12	123
Rankin,Pa. A7	123
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	143
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

WIRE (16 gage)

	An'ld. Galv.	Stone	Galv. Stone
Aliquippa Jc	9.05	10.55	
Bartnvill,Ill.19 K4	9.05	10.55	
Cleve. A7	9.05	10.55	
Johnstwn B2	9.05	10.55	
Kokomo C16	9.05	10.10	
Minnequa C10	9.40	10.90	
Pitts.Cal. C11	9.40	10.90	
Prtsmth.(18) P12	9.05	10.55	
Sp.Pt., B2	9.15	10.65	
Struthers Y1	9.05	10.55	
Waukegan A7	9.05	10.55	

WOVEN FENCE, 9-15½ gage

	Col.
Ala.City,Ala.,17-18ga.	R2.175
AlabamaCity,Ala.	R2....109
Alquip.,Pa.9-14½ga.	J5..109
Atlanta A11	111
Bartonville,Ill.(19) K4	109
Crawfordsvll,Ind. M8	112
Donora,Pa. A7	109
Duluth A7	109
Houston,Tex. S5	117
Fairfield,Ala. T2	109
Johnstown,Pa. B2	109
Johnstn,17ga.,6" B2	183
Johnstn,17ga.,4" B2	186
Joliet,Ill. A7	109
KansasCity,Mo. S5	121
Kokomo,Ind. C16	111
Minnequa,Colo. C10	116
Monessen,Pa. P7	109
Pittsburg,Calif. C11	132
Portsmouth,O.(18) P12	109
Rankin,Pa. A7	109
So.Chicago,Ill. R2	109
Sterling,Ill.(1) N15	109

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	106
Atlanta A11	107
Bartonville,Ill.(19) K4	106
Chicago W13	106
Crawfordsville M8	109
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Joliet,Ill. A7	106
Kokomo,Ind. C16	108
Minnequa,Colo. C10	113
Pittsburg,Calif. C11	130
Portsmouth,O.(18) P12	106
So.Chicago,Ill. R2	106
So.SanFran.,Calif. C10	130
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	106

NAIL & STAPLES, Non-Stock

	Galv.
AlabamaCity,Ala. R2	5.20
Bartonville,Ill.(19) K4	5.20
Donora,Pa. A7	5.20
Duluth A7	5.20
Johnstown,Pa. B2	5.20
Joliet,Ill. A7	5.20
Kokomo,Ind. C16	5.30
Minnequa,Colo. C10	5.55
Pittsburg,Calif. C11	6.15
Portsmouth,O. P12	5.20
Rankin,Pa. A7	5.20
So.Chicago,Ill. R2	5.20

ROPE WIRE

	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	7.10	7.40	7.80
Cleveland A7	7.50	7.80	8.20
Donora,Pa. A7	7.50	7.80	8.20
Johnstown,Pa. B2	7.50	7.80	8.20
Monessen,Pa. P7	7.50	7.80	8.20
NewHaven,Conn. A7	7.80	8.10	8.50
Portsmouth,O. P12	7.50	7.80	8.20
SparrowsPoint,Md. B2	7.60	7.90	8.30
Struthers,O. Y1	7.50	7.80	8.20
Trenton,N.J. A7	7.80	8.10	8.50
Trenton,N.J. R5	7.50	7.80	8.20
Waukegan,Ill. A7	7.50	7.80	8.20
Williamsport,Pa. B2	7.60	7.90	8.30
Worcester,Mass. J4	7.50	7.80	8.20

RAILS

	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb. Under
Bessemer,Pa. C3	3.20	3.10	3.15	3.55
Ensley,Ala. T2	3.20	3.10	3.15	3.55
Fairfield,Ala. T2	...	...	...	3.55
Gary,Ind. C3	3.20	3.10	3.15	...
Ind.Harbor,Ind. I2	3.20	3.10	3.15	...
Johnstown,Pa. B2	...	...	...(16)	3.55
Lackawanna B2	3.20	3.10	...	3.55
Minnequa,Colo. C10	3.20	3.10	...	4.25
Steelton,Pa. B2	3.20	3.10	...	...

NAILS & STAPLES, Stock (To Consumers)

	Col.
AlabamaCity,Ala. R2	103
Aliquippa,Pa. J5	103
Atlanta A11	105
Bartonville,Ill.(19) K4	103
Cleveland A9	110
Crawfordsville M8	106
Donora,Pa. A7	103
Duluth A7	103
Fairfield,Ala. T2	103
Houston,Tex. S5	111
Johnstown,Pa. B2	103
Joliet,Ill. A7	103
KansasCity,Mo. S5	115
Kokomo,Ind. C16	105
Minnequa,Colo. C10	110
Monessen,Pa. P7	103
Pittsburg,Calif. C11	122
Portsmouth,O. P12	103
Rankin,Pa. A7	103
So.Chicago,Ill. R2	103
SparrowsPoint,Md. B2	105
Sterling,Ill.(1) N15	103
Torrance,Calif. C11	123
Worcester,Mass. A7	109

NAILS & STAPLES, Stock (To Jobbers)

	Col.
Chicago,Ill. W13	103
Minnequa,Colo. C10	107
Portsmouth,O. P12	100

NAILS, Cut (100 lb keg)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

FENCE POSTS

	Col.
Duluth A7	112
Johnstown,Pa. B2	112
Joliet,Ill. A7	112
Minnequa,Colo. C10	120
Moline,Ill. R2	116
Williamspt,Pa., S19	n.t.$120

AXLES

Fairfield,Ala. T2	5.20
Gary,Ind. C3	5.20
Ind.Harbor,Ind. S13	5.20
Johnstown,Pa. B2	5.20
McKeesRocks,Pa. C3	5.20

TIE PLATES

Fairfield,Ala. T2	4.05
Gary,Ind. C3	4.05
Ind.Harbor,Ind. I2	4.05
Lackawanna B2	4.05
Minnequa,Colo. C10	4.05
Pittsburg,Calif. C11	4.20
Pittsburgh R2	4.05
Seattle B3	4.50
Steelton,Pa. B2	4.05
Torrance,Calif. C11	4.20
Weirton,W.Va. W6	4.05

JOINT BARS

Bessemer,Pa. C3	4.25
Fairfield,Ala. T2	4.25
Ind.Harbor,Ind. I2	4.25
Joliet,Ill. C3	4.25
Lackawanna B2	4.25
Minnequa,Colo. C10	4.25
Steelton,Pa. B2	4.25

TRACK BOLTS

	(20) Treated
Fairfield,Ala. T2	8.50
Lebanon,Pa. B2	8.50
Minnequa,Colo. C10	8.25
Pittsburgh,Pa. O3, P14	8.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	5.35
Ind.Harbor,Ind. I2, Y1	5.35
Lebanon,Pa. B2	5.35
Minnequa, Colo. C10	5.35
Pittsburgh J5	5.35
So.Chicago,Ill. R2	5.35
Struthers,O. Y1	5.35
Youngstown R2	5.35

LIGHT RAILS, Rail Steel

Huntington,W.Va. W7	3.55
Williamsport,Pa. S19	3.55

Key to Producing Companies

L7 Lukens Steel Co.
M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.
N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 New Eng. Hgh. Carb. Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S. & W. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P5 Pilgrim Drawn Steel Crp.
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P12 Portsmouth Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R7 Rotary Electric Steel Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss Sheffield S. & I. Co.
S13 Standard Forgings Corp.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San. Corp.
U4 Universal Cyclops Steel
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Wstrn. Auto. Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Co.
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstwn. Sheet & Tube

STANDARD PIPE, T. & C.

BUTTWELD

Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	41.5	39.5	38.5	13.5	11.5	10.5
¼	6.0	0.42	39.5	37.5	36.5	15.5	13.5	12.5
⅜	6.0	0.57	36	34	33	12.5	10.5	9.5
½	8.5	0.85	43	41	42	26.5	24.5	25.5
¾	11.5	1.13	46	44	45	30.5	28.5	29.5
1	17.0	1.68	48.5	46.5	47.5	33.5	31.5	32.5
1¼	23.0	2.28	49	47	48	34	32	33
1½	27.5	2.73	49.5	47.5	48.5	34.5	32.5	33.5
2	37.0	3.68	50	48	49	35	33	34
2½	58.5	5.82	50.5	48.5	49.5	35.5	33.5	34.5
3	76.5	7.62	50.5	48.5	49.5	35.5	33.5	34.5

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va. 1½ percentage point lower on ⅛", 2 points lower on ¼", 3 points lower ⅜", W10; Wheatland, Pa., 2 points lower on ⅛ through ⅜", W9. Following make ½ through 3" only: Lorain, O. N3; Youngstown R2, Y1; Aliquippa, Pa. J5.

Columns B & E: Sparrows Point, Md. B2; Wheatland, Pa., ⅛ through ⅜", W9.

Column C & F: Alton, Ill. (Lorain, O. Base) L1; Indiana Harbor, Ind., ½ through 3", Y1.

Column D: Etna, Pa. N2; Monaca, Pa. P9. Sharon, Pa. M6; Butler, Pa., ⅛ through ⅜", F6; Benwood, W. Va., except 3½ points lower on ⅛", 2½ pts on ¼", 3 pts on ⅜" W10; Wheatland, Pa., except 2 pts lower on ⅛ through ⅜" W9. Following make ½ through 3" only; Lorain N3; Youngstown R2, Y1; Aliquippa, Pa. J5.

SEAMLESS AND ELECTRIC WELD

Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	5.68	38.5	23	38.5	23
2½	58.5	5.82	41.5	26	41.5	26
3	76.5	7.62	41.5	26	41.5	26
3½	92.0	9.20	43.5	28	43.5	28
4	$1.09	10.89	43.5	28	43.5	28
5	1.48	14.81	43.5	28	43.5	28
6	1.92	19.18	43.5	28	43.5	28

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, O. N3; Youngstown Y1.

Columns C & D: Youngstown R2.

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	37.50	30.50	28.50
302	37.50	33.00	28.50
303	39.50	36.50	31.00
304	39.50	35.00	30.00
309	52.00	52.00	41.50
316	53.00	55.00	46.00
321	45.50	44.50	34.00
347	50.00	48.50	38.50
410	33.00	27.00	23.00
416	33.50	33.50	23.50
420	40.50	43.50	28.50
430	35.50	27.50	23.50
501	24.00	22.50	11.50
502	25.00	23.50	12.50

Baltimore, Types 301 through 347 sheets, except 309 E2

Baltimore, bars, wire and structurals A10

Brackenridge, Pa., sheets A4

Bridgeville, Pa., bars, wire, sheets & strip, except Type 309 strip quoted 51.00c U4

Butler, Pa., sheets except Types 501 & 502 A10

Carnegie, Pa., strip except Type 416; Type 309 strip quoted 51.00c S18.

Cleveland, strip, except Type 309 quoted 51.00c, and except Type 416 A7.

Detroit, strip, except Type 309 quoted 51.00 M1

Dunkirk, N.Y., bars, wire A4

Duquesne, Pa., bars C3

Gary, Ind., sheets except Type 416 C3

Harrison, N. J., strip C18

Massillon, all products, except Type 309 bars, wire & structurals quoted 42.00c, Type 501 10.50c, Type 502 11.50c R2

McKeesport, Pa., bars; sheets except Type 416, C3

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2

Middletown, O., sheets and strip, except Types 501 and 502 and except 309 strip quoted 51.00c A10

Midland, sheets & strip C18

Munhall, Pa., bars C3

Pittsburgh, sheets C18

Reading, Pa., bars & strip except Type 309 bars quoted 42.00c C4

So. Chicago, Ind., bars & structurals C3

Syracuse, N. Y., bars, wire & structurals C18

Titusville, Pa., bars U4

Wallingford, Conn., strip W2

Washington, Pa., bars, sheets & strip except Type 309 strip quoted 51.00c J3

Washington, Pa., Types 301 through 347 sheets & strip except 303 & 309; 316 sheets 58.00c strip 60.00c W4

Watervliet, N. Y., structurals & bars A4

Waukegan, bars & wire A7

West Leechburg, Pa., strip, except Type 309 quoted 51.00c A4

Youngstown, strip C8.

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	19.00	18W,4Cr,3V	114.50
Extra Carbon	22.00	18W,4Cr,2V,9Co	168.50
Spec. Carbon	26.50	18W,4Cr,2V,6Co	154.00
Oil Hardening	29.00	18.25W,4.25Cr,1V,4.75Co	142.00
Hi.-Carbon-Cr	52.00	20.25W,4.25Cr,1.6V,12.25Co	266.50
Cr Hot Wrk	29.00	1.5W,4Cr,1V,8.5Mo	65.00
18W,4Cr,1V	90.50	6.4W,4.5Cr,1.9V,5Mo	69.50
18W,4Cr,2V	102.50	6W,4Cr,3V,6Mo	88.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M9, R2, S8, T7, U4, V2, V3.

(1) Chicago Base. (2) Angles.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. Base.
(7) Deformed.
(8) 16 gage and heavier.
(9) 6" and narrower.
(10) Pittsburgh Base.
(11) Cleveland & Pittsburgh Base.
(12) Worcester, Mass. Base.
(13) 3" & wider; over ½" to under 3" 5.00c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh Base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. Base.
(22) Del. San Fran. Bay area
(23) Angles 1"x1" to 1¾"x1¾" only.

BOLTS, NUTS

(To consumers)

Fob midwestern plants. Additional discounts on carriage, machine bolts, 5 for cl; 15 for full containers, except tire and plow bolts.

CARRIAGE, MACHINE BOLTS

(Per cent off list)

½-in., smaller; up to 6 in long 35
⅝ & ¾ x 6 in., shorter. 37
¾-in. & larger x 6 in., shorter 34
All diameters longer than 6-in. 30
Tire bolts 25
Plow bolts 47
Lag bolts, 6 in., shorter 37
Lag bolts, longer than 6 in. 35

STOVE BOLTS

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

NUTS

Semifinished hexagon	A.S. Light	Reg. & Heavy
⅞-in., smaller	41 off	.....
½-in., smaller	....	38 off
½-in.-1-in.	....39 off	.....
⅞-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	.37 off	35 off
1⅝-in., larger	.34 off	28 off

Additional discount of 15 for full containers.

SQUARE HEAD SET SCREWS

Upset 1-in. & smaller .51 off
¾, ⅞, & 1 x 6-in. & shorter .....35 off
Headless, ¼-in., larger 31 off

HEXAGON CAP SCREWS

(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright) ..... 46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter ..... 40 off

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 6.75c
⅞-in., under .....48 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....Net to $1 off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb.
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4,5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	84,90	7.50
14	60,72	8.00
10,12	60	8.25
8	60	8.50

Raw Material and Fuel

REFRACTORIES

(Prices per 1000 brick, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hardfired, $135 at above points.

High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

LADLE BRICK

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa., Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Dometic dead-burned, ⅜" grains; Bulk, $30.50-$31.00; single paper bags, $35.00-$35.50.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk: Bilimeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer ...$7.60
Old range nonbessemer..7.45
Mesabi bessemer 7.35
Mesabi nonbessemer ...7.20
High phosphorus 7.20

EASTERN LOCAL ORE

Cents, unit, del. E. Pa.

Foundry and basic 56.62% concentrates, contract 16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:
Spot: 17.00
Long-term contract..15.00
Brazil iron ore, 68-69% 19.50

TUNGSTEN ORE

Wolframite scheelite, net ton unit, duty pd. $26-$28

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. U.S. ports; prices on lower grades adjusted to Mn content and impurities.

CHROME ORE

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African
48% 2.8:1 ..... 37.50
48% 3:1 ..... 39.00
48% no ratio 31.00

South African Transvaal
44% no ratio ...$25.50-26.00
45% no ratio 26.50
48% no ratio 29.00-30.00
50% no ratio .. 29.50-30.50

Brazilian—nominal
44% 2.5:1 lump $33.65

Rhodesian
45% no ratio $27-27.50
48% no ratio 30.00
48% 3:1 lump 39.00

Domestic—rail nearest seller
48% 3:1 .....$39.00

MOLYBDENUM

Sulphide conc., lb, Mo, cont. Mines $0.90

METALLURGICAL COKE

Price per Net Ton

BEEHIVE OVENS

Connellsvll, fur. $13.00-13.50
Connellsvll, fdry. 15.50-16.00
New River, foundry ..18.00
Wise county, foundry..15.35
Wise county, furnace..14.60

OVEN FOUNDRY COKE

Kearney, N. J., ovens..$22.00
Everett, Mass., ovens ....
New England, del.‡..22.70
Chicago, ovens 20.00
Chicago, del. .....†21.45
Detroit, del. 23.91
Terre Haute, ovens....20.20
Milwaukee, ovens 20.75
Indianapolis, ovens ...19.85
Chicago, del. 23.32
Cincinnati, del. 22.77
Detroit, del. 23.75
Ironton, O., ovens. ...19.40
Cincinnati, del. 21.63
Painesville, O., ovens..20.90
Buffalo, del. 23.02
Cleveland, del. 22.62
Erie, del. 21.04
Birmingham, ovens 17.70
Philadelphia, ovens 20.45
Swedeland, Pa., ovens..20.40
Portsmouth, O., ovens..19.50
Detroit, ovens 20.65
Detroit, del. *21.70
Buffalo, del. 22.95
Flint, del. 23.00
Pontiac, del. 21.98
Saginaw, del. 23.30

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.03 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 20.00
Toluol, one deg.. 19.00-23.50
Industrial xylol .. 20.50-26.50

Per ton bulk, ovens
Sulphate of ammonia $45.00

Per pound, ovens
Phenol, 40 (carlots, returnable drums) 13.25
Do., less than carlots .. 14.00
Do., tank cars 12.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS				PLATES	
	H.R. 18 Ga., Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§	Standard Structural Shapes	Carbon	Floor
New York (city)	5.60	6.51	7.10	5.82	...	5.77	6.31	8.28	5.53	5.85	7.36
New York(c'try)	5.40	6.31	6.90	5.62	...	5.57	6.11	8.08	5.33	5.65	7.16
Boston (city) ..	5.75	6.75**	7.16	5.80	...	5.72	6.22	8.77	5.62	5.95	7.45
Boston (c'try) .	5.55	6.55**	6.96	5.60	...	5.52	6.02	8.57	5.42	5.75	7.25
Phila. (city)...	5.80	6.39	6.78	5.55	...	5.55	6.11	8.00	5.25	5.50	6.70
Phila. (c'try) ..	5.65	6.24	6.63	5.40	...	5.40	5.96	7.85	5.10	5.35	6.55
Balt. (city)....	5.46	6.36	6.81	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31	6.21	6.66	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)..	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
Buffalo (w'hse)	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
Pitts. (w'hse)..	4.85	5.75[4]*	6.80	5.00	6.00	4.90	5.40	9.20††	4.90	5.05	6.55
Detroit (w'hse)	5.32	6.22[4]*	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.70	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse).	4.85	5.75	6.55	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse).	5.26‡	5.94**	6.83	5.38	6.10	5.43	5.94	...	5.43	5.63	7.03
Chicago (city) .	5.05	5.95[4]	7.05	5.05	6.35-6.85	5.10	5.60	7.90[8]	5.10	5.30	6.75
Chicago (w'hse)	4.85	5.75[4]	6.85	4.85	6.15-6.65	4.90	5.40	7.70[8]	4.90	5.10	6.55
Milwaukee (city)	5.18	6.08[4]	7.18	5.18	6.48-6.98	5.23	5.78	8.03[8]	5.23	5.43	6.88
Milwau. (c'try).	5.03	5.93[4]	7.03	5.03	6.33-6.83	5.08	5.63	7.88[8]	5.08	5.28	6.73
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse) .	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.00	5.90	6.55	5.00	...	5.00	6.83	...	5.05	5.25	7.69
Birm'ham(c'try)	4.85	5.75	6.40	4.85	...	4.85	6.68	...	4.90	5.10	7.54
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	6.60	8.05**	7.60	6.80	7.75	6.25	8.20	...	6.10	6.30	8.20
L. A. (w'hse)..	6.45	7.90**	7.45	6.65	7.60	6.10	8.05	...	5.95	6.15	8.05
San Francisco..	6.15[10]	7.50[3]	8.10	6.75[10]	8.25[8]	5.90[10]	7.55	10.85[2]	5.90	6.35	8.10
Seattle-Tacoma.	6.70[7]‡	8.15[3]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.35	6.00[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); § as rolled; ** 17 gage; †† as annealed. Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499 lb.

LEADING FERROALLOY PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max, 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices. **75% Ferrosilicon:** Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices. **90-95% Ferrosilicon:** Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35. F.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Grainal: Vanadium Grainal No. 1, 93c; No. 6 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, freight allowed. Spot, add 5c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more. 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot, 2" x D, $2.90 per lb of contained Cb, less ton $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8% Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed. 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, M 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.00c per lb of alloy; ton lots 18.00c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.55c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); Gross tons per carload, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferrom lybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.

British Revise Metal Quotations

Ministry of Supply raises prices 20 to 40 per cent above previous sterling prices on copper, lead, zinc and aluminum, but dollar equivalents are less. Tin action awaited

New York—New nonferrous metal prices announced by the British Ministry of Supply, following devaluation of the pound sterling to $2.80, are 20 to 40 per cent above those previously established on a pound sterling basis but are lower on a dollar equivalent basis and closer to what American consumers are paying.

The new copper price to the British user is £140 a long ton, equal to 17.50c a pound, delivered to the customer's plant in Britain. The old price had been £107 10s, equal to 19.34c a pound at the former $4.03¼ Sterling quotation. American consumers are paying 17.62½c a pound, which also is the price of foreign origin metal for users outside the United States.

The British Ministry's price for lead is now £122 a long ton, or 15.25c a pound delivered to the users' plants in Britain. The old price had been £87 5s, or 15.71c a pound. United States consumers are paying 15.12½c a pound. The price for foreign lead to users outside Great Britain is 14.62½c a pound, which is about equivalent to the new English price after adding shipping and other charges from the Gulf of Mexico ports.

British makers of zinc products will pay a new price of £87 10s a long ton, or 10.94c a pound, delivered to their plants. The former price was £63 10s, equal to 11.43c a pound at the old sterling rate of $4.03¼. The United States price for zinc is 10.00c, East St. Louis. Foreign slab zinc is quoted at 9.50c a pound at the Gulf ports which would figure to a price of a little more than 10.00c if shipped to an English consumer.

The British consumer of aluminum will pay £112 a long ton, equal to 14.00c a pound at the devalued $2.80 Sterling exchange. The price had been £93 a long ton, or 16.75c a pound on the $4.03¼ Sterling quotation. The United States price for aluminum is 17.00c a pound and the price of aluminum in Canada, where the British get their major supply of this metal, had been 15.50c a pound before the Canadian government cut the Canadian dollar by 10 per cent. There has been no new price announced for aluminum in Canada since the Canadian devaluation action.

The new price for copper approximates the United States export price, or ⅛-cent below the current asking price of 17.62½c, f.a.s. New York. This portends smaller purchases of electrolytic on a dollar basis here by foreign purchasers.

The slight reductions in currency equivalents on zinc and lead indicate that the Ministry of Supply expects a slight drop in supplies of those metals from dollar nations. However, prices for both zinc and lead for delivery to consumer plants in the United Kingdom are about the same as quotations operative in New York.

Pricing of aluminum 3.50 cents under copper may mean that the Ministry of Supply is encouraging the use of that metal as a substitute for copper, or that a special deal has been made with Canadian producers.

The new British prices are not expected to have much effect on the domestic market. The new British price of 10.94c for prime western zinc is still higher than the world price for that metal as well as the export price here of 9.50c, f.a.s. Gulf ports.

Copper—While all interests in the nonferrous metal markets here are studying the probable effects of the devaluation and metal price announcements, they are more concerned over the economy at home. Unsettlement on the labor front, particularly in steel and coal, has cast a shadow over the previously bright prospects for fall business. This was initially reflected in the metal markets by a further easing in copper scrap prices.

Although there has been no substantial increase in the amount of material being offered, one of the largest refiners reduced buying prices to the basis of 14.00c for No 1 copper wire scrap Brass ingot producers also have reduced sharply their offering prices on scrap.

Primary copper producers continue to book fair tonnages on the basis of 17.62½c.

Lead—Consumers of lead continue to place substantial orders for September shipment on the basis of 14.92½c, St. Louis. Battery makers and cable drawers expect to use large tonnages in their operations over the balance of this year unless general business activity is slowed by prolonged strikes in basic industries. Shipments of replacement batteries in August totaled 2,654,000 units, an increase of more than 1 million from the July total. In August, 1948, shipments amounted to 2,519,000 units. Total shipments for the first eight months of this year amounted to 9,165,000 units compared with 13,790,000 units shipped in the like period a year ago.

Zinc—Due to the uncertain outlook for continued high rate of operations in the steel industry, new bookings in the zinc market are light. Galvanizers generally have ample supplies of zinc on hand and are awaiting developments before placing additional large orders. Consumers are also fearful of the effects of the coal strike, which, if prolonged, would have a serious effect on the general economy.

As a result of the 10 per cent devaluation of the Canadian dollar, prices of zinc in Canada are ¾-cent higher at 11.00c for prime western, 11.75c for high grade, 12.00c for special high grade. These advances amount to only about 7 per cent as against 10 per cent dollar devaluation.

Tin—The British Ministry of Supply's prices on tin have not been made public at this writing. Consensus in the trade here is that prices will be somewhere between 88.00c and 98.00c a pound against $1.03 previously. Unless it is near the lower level, many buyers will avail themselves of deferred pricing, if given this option.

The delay in announcing a tin price is attributed to the need of consultations between British, Dutch and possibly Belgian producers. RFC selling prices here continue on the basis of $1.03 for Straits.

New Park Mining Reopens

Park City, Utah—New Park Mining Co. has resumed operations at its properties here on a limited scale, and initial shipments will be made shortly, W. H. H. Cranmer, president, announces. Production will not be in full swing until the first of 1950, he said, adding that preliminary work has consisted largely of inspections.

Activity in the immediate future will be concentrated upon the Pearl fissure because of higher values of ore in that gold-bearing vein. Development will extend to the 1500 level. Producers in this area shut down July 1, due to declining metals prices combined with demands for increased pay by union miners. Other operators now are considering the possibility of resuming operations.

British Platinum Price

London—One metal firm here has fixed its price for platinum at £24 10s per troy ounce, according to trade reports. This compares with the predevaluation level of £18.

New Seattle Warehouse Opens

Spokane—Empire Steel Co. has opned its new $400,000 warehouse and distribution plant. President C. W. Summerville, Seattle, announces it will carry complete stocks including aluminum products, tool and alloy stainless, reinforcing bars, nails, etc. The plant is situated on two railroads and is equipped with bridge crane and other modern facilities.

No Big Alaskan Construction

Washington—Alaska Public Works Act, signed by President Truman as Public Law 264, 81st Congress, will not implement any large-scale construction program in the territory, according to contemplated appropriation requests.

The figures now under discussion are $2 million cash and $8 million in authorizations. These funds are to be spent on a matching basis for construction of schools, hospitals, sewer and water projects, harbor facilities, bridges, roads, sidewalks, etc. The main Alaska improvement bill, H. R. 940, which would authorize construction of the $21 million Eklutna hydroelectric plant and transmission system near Anchorage, Alaska, passed the House on July 13 but is held up in the Senate Committee on Interior and Insular Affairs.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 17.62½c, Conn. Valley, Lake, 17.75c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 15.50-16.50c; 88-10-2 (No. 215) 24.50c; 80-10-10 (No. 305) 21.00c; No. 1 yellow (No. 405) 13.25-14.25c.

Zinc: Prime western 10.00c, brass special 10.25c, intermediate 10.50c, East St. Louis; high grade 11.00c, delivered.

Lead: Common 14.92½c; chemical 15.02½c; corroding 15.02½c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 16.00-16.50c; No. 12 foundry alloy (No. 2 grade) 15.25-15.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 17.25c; grade 2, 16.25c; grade 3, 15.25c; grade 4, 14.25c. Prices include freight at carload rate up to 75 cents per 100 lb.
5% titanium-aluminum alloy No. 1 (low Cu) 31.00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddystone, Pa.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024; grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $73-$75 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 73.25c per ounce.

Platinum: $69-$72 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 16-cent copper.)

Sheet: Copper 31.30; yellow brass 28.19; commercial bronze, 95%, 31.28; 90%, 30.84; red brass, 85%, 29.89; 80%, 29.47; best quality, 29.01; nickel silver, 18%, 41.78; phosphor-bronze, grade A, 5%, 50.47.

Rods: Copper, hot rolled 27.15; cold drawn 28.40; yellow brass free cutting, 22.76; commercial bronze, 95% 30.97; 90% 30.53; red brass 85% 29.58; 80% 29.16.

Seamless Tubing: Copper 31.34, yellow brass 31.20; commercial bronze 90% 33.50; red brass 85% 32.80; 80% 32.38.

Wire: Yellow brass 28.48; commercial bronze, 95% 31.57; 90% 31.13; red brass, 85% 30.18; 80% 29.76; best quality brass 29.30.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots 22.42½, l.c.l. 23.05, c.l. 22.55; weatherproof, f.o.b. eastern mills, 100,000 lb lots 24.693, l.c.l. 25.443, c.l. 24.943; magnet, delivered, c.l. 27.62½, 15,000 lb or more 27.87½, l.c.l. 28.37½.

ALUMINUM

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $20.12½ per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $20.12½ per cwt. Traps and Bends: List price plus 55%.

ZINC

Sheets, 15.50c f.o.b. mill, 36,000 lb and over Ribbon zinc in coils, 15.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 14.00c; over 12-in., 15.00c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton, 27.00c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 27.96c; oval 27.46c; cast 25.99c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.25c; over 250 lb, 24.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 2090 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 40.50c, f.o.b. Cleveland; 39.25c, Detroit; 39.25c, Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 88.00c; 100 lb kegs, 89.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	14.62½	14.62½	13.87½
Yellow brass	12.00	11.75	11.00
Commercial Bronze			
95%	13.62½	13.37½	12.87½
90%	13.50	13.25	12.75
Red brass			
85%	13.25	13.00	13.12½
80%	13.00	12.75	12.25
Best Quality (71-80%)	12.87½	12.62½	12.12½
Muntz Metal	11.12½	10.87½	10.37½
Nickel, silver, 10%	14.00	13.75	7.00
Phos. bronze, A	16.37½	16.12½	15.12½
Naval brass	11.62½	11.37½	10.87½
Manganese bronze	11.62½	11.37½	10.75

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 14.00; No. 2 copper 13.00; light copper 12.00; composition red brass 11.25-11.50; radiators 9.25; heavy yellow brass 9.00-9.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 14.00-14.25; No. 2 copper 13.00-13.25; light copper 12.00; refinery brass (60% copper) per dry copper content 12.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 12.75-13.00; No. 2 11.75-12.00; light copper 10.75-11.00; No. 1 composition red brass 9.25-9.50, No. 1 composition turnings 8.75-9.00, mixed brass turnings 5.75-6.00; new brass clippings 10.00-10.50, No. 1 brass rod turnings 7.75-8.00; light brass 5.75-6.00; heavy yellow brass 6.25-6.50; new brass rod ends 7.75-8.00; auto radiators, unsweated 7.75-8.00; cocks and faucets, 7.50-7.75; brass pipe 8.25-8.50.

Lead: Heavy 11.25-11.75, battery plates 6.50-6.75, linotype and stereotype 11.75-12.00, electrotype 10.50-11.00, mixed babbitt 11.75-12.00, solder joints, 14.50-15.00.

Zinc: Old zinc 4.00-4.50, new die cast scrap 3.50-4.00, old die cast scrap 2.50.

Tin: No. 1 pewter 52.00-54.00, block tin pipe 70.00-72.00, No. 1 babbitt 40.00-42.00.

Aluminum: Clippings 2S 10.00-10.50, old sheets 7.00-7.50, crankcase 7.00-7.50, borings and turnings 3.00-3.50.

DAILY PRICE RECORD

1949	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Sept. 8-22	17.62½	14.92½	10.00	103.00	17.00	38.50	40.00	73.25
Sept. 7	17.62½	14.92½	10.00–10.50	103.00	17.00	38.50	40.00	73.25
Sept. 1-6	17.62½	14.92½	10.00–10.50	103.00	17.00	38.50	40.00	73.00
Aug. Avg.	17.625	14.806	10.000	103.00	17.000	38.500	40.000	71.889
July Avg.	17.279	13.335	9.346	103.000	17.000	38.500	40.000	71.500
June Avg.	16.606	11.850	9.548	103.000	17.000	38.500	40.000	71.500

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's com mission, delivered at consumer's plant except where noted.

STEELMAKING SCRAP COMPOSITE

Sept. 22	$27.08
Sept. 15	26.92
Aug. 1949	20.86
Sept. 1948	43.33
Sept. 1944	18.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$29 50-30.00
No. 2 Heavy Melt.	27.50-28.00
No. 1 Busheling	29.50-30.00
No. 1 Bundles	29.50-30.00
No. 2 Bundles	27.50-28.00
No. 3 Bundles	26.50-27.00
Heavy Turnings	22 00-23.00*
Machine Shop Turnings	20.00†
Mixed Borings, Turnings	20.00†
Short Shovel Turnings.	22.00
Cast Iron Borings	21.00
Low Phos. Steel	31.00-32.00*

Cast Iron Grades

No. 1 Cupola Cast	34.00-35.00
No. 1 Machinery Cast.	38.00-39.00
Charging Box Cast	30.00-31.00*
Heavy Breakable Cast.	28.00-29.00*
Brake Shoes	30.00-31.00*

Railroad Scrap**

No. 1 R.R. Heavy Melt.	32.00-32.50
Axles	36.00-37.00
Rails, Random Length.	35.00-36.00
Rails, 2 ft and under	39 00-40.00
Rails, 18 in. and under	40.00-41.00
Railroad Specialties	33.00-34.00
Angles, Splice Bars	33 00-34.00

* Nominal.
** Brokers' purchase prices.
† Crushers' buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	$26.50†
No. 2 Heavy Melt. Steel	25.50†
No. 1 Busheling	26.50†
No. 1 Bundles	26.50†
No. 2 Bundles	23.50†
Machine Shop Turnings	17.00†
Mixed Borings, Turnings	19.00†
Short Shovel Turnings.	19.00†
Cast Iron Borings	19.00†
Bar Crops and Plate	27.50†
Punchings & Plate Scrap	27.50†
Cut Structurals	29.50†

† Nominal.

Cast Iron Grades†

No. 1 Cupola	40.00-41.00
Charging Box Cast	34.00-35.00
Stove Plate	35.00-36.00
Heavy Breakable Cast.	32.00-33.00
Unstripped Motor Blocks	30 50-31.50
Malleable	34.00-35.00
Brake Shoes	31 00-32.00
Clean Auto Cast	42.00-43.00
No. 1 Wheels	35.00-36.00
Burnt Cast	32 00-33.00

† Nominal.

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-33.00
R.R. Malleable	34.00-35.00
Rail, 3 ft and under	38.00-39.00
Rails, Random Lengths	32.00-33.00
Cast Steel	27.00-28.00
Railroad Specialties	31.00-32.00
Uncut Tires	30.50-31.00
Angles, Splice Bars	34.00-35.00

VALLEY

No. 1 Heavy Melt. Steel	$31.00-31.50
No. 2 Heavy Melt. Steel	30.00-30.50
No. 1 Bundles	31.00-31.50
No. 2 Bundles	27 00-27.50
Machine Shop Turnings	19.00-20.00
Short Shovel Turnings.	22.00-23.00
Cast Iron Borings	22 00-23.00
Low Phos.	32 00-33.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32 00-33.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	23.50
No. 1 Busheling	23.50
No. 1 Bundles	25.00
No. 2 Bundles	22.50
Machine Shop Turnings	17.00-18.00
Short Shovel Turnings.	18.00-19.00
Mixed Borings, Turnings	16.00-17.00
Bar Crop and Plate	27.00-28.00
Punchings & Plate Scrap	27.00-28.00
Cut Structurals	26 00-27.00
Elec. Furnace Bundles.	25.00-25.50
Heavy Turnings	25.00
No. 1 Chemical Borings	23.00-24.00

Cast Iron Grades

No. 1 Cupola Cast	38.00
No. 1 Machinery Cast.	39.00
Charging Box Cast	35.00-36.00
Heavy Breakable Cast.	35.00-36.00
Unstripped Motor Blocks	33.00
Clean Auto Cast	39.00
No. 1 Wheels	38.00-39.00
Malleable	36.00-37.00*

* Nominal.

CINCINNATI

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	22.00
No. 1 Busheling	25.00
No. 1 Bundles	25.00
No. 2 Bundles	20.00
Machine Shop Turnings	11.00
Short Shovel Turnings.	15.00
Mixed Borings, Turnings	15.00
Cast Iron Borings	15.00

Cast Iron Grades

No. 1 Cupola Cast	38.50
Charging Box Cast	31.00
Heavy Breakable Cast.	34.00
Stove Plate	30.00
Unstripped Motor Blocks	20.00
Brake Shoes	22.00
Clean Auto Cast	38.50
Drop Broken Cast	43.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	27.00
R.R. Malleable	33.00
Rails, Rerolling	37.00
Rails, Random Lengths	35.00
Rails, 18 in. and under	43.50

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$20.00-21.00
No. 1 Bundles	23.00-24.00
No. 2 Bundles	20.00-21.00
No. 1 Busheling	23.00-24.00
Machine Shop Turnings	15.00-16.00
Mixed Borings, Turnings	15.00-16.00
Short Shovel Turnings.	17.00-18.00
Cast Iron Borings	17.00-18.00
Punchings & Plate Scrap	23.00-24.00

Cast Iron Grades

No. 1 Cupola Cast	32.00-33.00
Heavy Breakable Cast.	28.00-29.00
Clean Auto Cast	32 00-33.00

BUFFALO

No. 1 Heavy Melt. Steel	$28.00-28.50
No 2 Heavy Melt. Steel	25 50-26.00
No. 1 Bushelings	25.50-26.00
No. 1 Bundles	27.50-28.00
No. 2 Bundles	24 00-24.50
Machine Shop Turnings	19 00-19.50
Mixed Borings, Turnings	20.00-20.50
Cast Iron Borings	20.00-20.50
Short Shovelings	21.50-22.00
Low Phos.	29.50-30.00

Cast Iron Grades

No. 1 Cupola	36 00-37.00
No. 1 Machinery	37.00-37.50
Mixed Yard	35.00-35.50
Malleable	35.50-36.00

Railroad Scrap

Rails, 3 ft. and under.	36 00-37.00
Scrap rails	31.00-32.00
Specialties	32.00-33.00
No. 1 car wheels	33.00-34.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$18.50
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling	15.00-16.00
No. 1 Bundles	18 00-18.50
No. 2 Bundles	14.00-15.00
No. 3 Bundles	nominal
Machine Shop Turnings	10.00-11.00
Mixed Borings, Turnings	10.00-11.00
Short Shovel Turnings.	11.00-12.00
Punchings & Plate Scrap	22.00-23.00
Cut Structurals	22.00-23.00
Elec. Furnace Bundles.	21.00

Cast Iron Grades

No. 1 Cupola Cast	31.00-32.00
No. 1 Machinery	33.00
Charging Box Cast	26.00-27.00
Heavy Breakable	26.00-27.00
Unstripped Motor Blocks	27.00
Malleable	27.00-28.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$17.00-17.50
No. 2 Heavy Melt. Steel	15.00-15.50
No. 1 Bundles	17.00-17.50
No. 1 Busheling	14.00-14.50
Machine Shop Turnings	6.50-7.00
Mixed Borings, Turnings	6.50-7.50
Short Shovel Turnings.	7.50-8.50
Bar Crops and Plate	17.50-18.00
Punchings & Plate Scrap	17.50-18.00
Chemical Borings	12.00-12.50

Cast Iron Grade

No. 1 Cupola Cast	30.00-31.00
Mixed Cast	27.00-28.00
Heavy Breakable Cast.	18.00-20.00
Stove Plate	22.00-23.00
Unstripped Motor Blocks	20.00-21.00

CHICAGO

No. 1 Heavy Melt. Steel	$26.00-27.00
No. 2 Heavy Melt. Steel	24.00-25.00
No. 1 Bundles	26.00-27.00
No. 2 Bundles	22.00-23.00
No. 3 Bundles	17.00-18.00
Machine Shop Turnings	16.00-17.00
Mixed Borings, Turnings	16 00-17.00
Short Shovel Turnings.	17.00-18.00
Cast Iron Borings	16.00-17.00
Bar Crops and Plate	29.00-31.00
Punchings	29.00-31.00
Elec. Furnace Bundles.	25.00-26.00
Heavy Turnings	23.00-24.00
Cut Structurals	27.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	41.00-42.00
Clean Auto Cast	41.00-42.00
No. 1 Wheels	33.00-34.00
Stove Plate	29.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	31.00-32.00
Malleable	34.50-35.50
Rails, Rerolling	41.00-42.00
Rails, Random Lengths	34.50-35.50
Rails, 2 ft. and under	38.00-39.00
Rails, 18 in. and under	39.00-40.00
Railroad Specialties	33.00-34.00
Angles, Splice Bars	35.50-36.50

ST. LOUIS

No. 1 Heavy Melt. Steel	$25.00-26.00
No. 2 Heavy Melt. Steel	21.00-22.00
Machine Shop Turnings	17.00-18.00
Short Shovel Turnings.	17.00-18.00

Cast Iron Grades

No. 1 Cupola Cast	36.00-38.00
Charging Box Cast	30.00-32.00
Heavy Breakable Cast.	29.00-30.00
Brake Shoes	29.00-30.00
Clean Auto Cast	36.00-38.00
Burnt Cast	29.00-30.00

Railroad Scrap

R.R. Malleable	30.00-31.00
Rails, Rerolling	36.00-37.00
Rails, Random Lengths	31.00-32.00
Rails, 3 ft. and under.	35.00-37.00
Uncut Tires	25.00-26.00
Angles, Splice Bars	35.00-36.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	24.50
No. 1 Busheling	24.00
No. 2 Bundles	22.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00
Short Shovel Turnings.	19.00
Cast Iron Borings	18.00
Bar Crops and Plate	30.00
Cut Structurals	23.00

Cast Iron Grades

No. 1 Cupola Cast	34.50
Stove Plate	28.00-30.00
No. 1 Wheels	23.00-24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.00
R. R. Malleable	nominal
Rails, Rerolling	30.00
Rails 3 ft. and under.	25.00-26.00
Angles and Splice Bars	31.00-33.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	15.00
Nos. 1 & 2 Bundles	13.00

Cast Iron Grades

No. 1 Cupola Cast	23.00-25.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	17.00
Wheels	17.00
Rails, Random Lengths	17.00

SEATTLE

No. 1 Heavy Melt. Steel	$16.00
No. 2 Heavy Melt. Steel	16.00
No. 1 Bushelings	13.50
Nos. 1 & 2 Bundles	14.00
No. 3 Bundles	nom.
Machine Shop Turnings	11.00
Mixed Borings, Turnings	11.00
Punchings & Plate Scrap	22.00
Cut Structural	22.00
Elec. Furnace Bundles.	23.00

Cast Iron Grades

No. 1 Cupola Cast	20.00-22.00
Heavy Breakable Cast.	17.00
Stove Plate	17.00
Unstripped Motor Blocks	17.00
Malleable	20.00
Brake Shoes	17.00-18.00
Clean Auto Cast	23.00
No. 1 Wheels	22.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	17.00
Railroad Malleable	22.00
Rails, Random Lengths	17.00
Angles and Splice Bars	17.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	24.00
Electric Furnace Bundles	26.00

Cast Iron Grades

No. 1 Cupola Cast	28.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	25.00

HAMILTON, ONT.

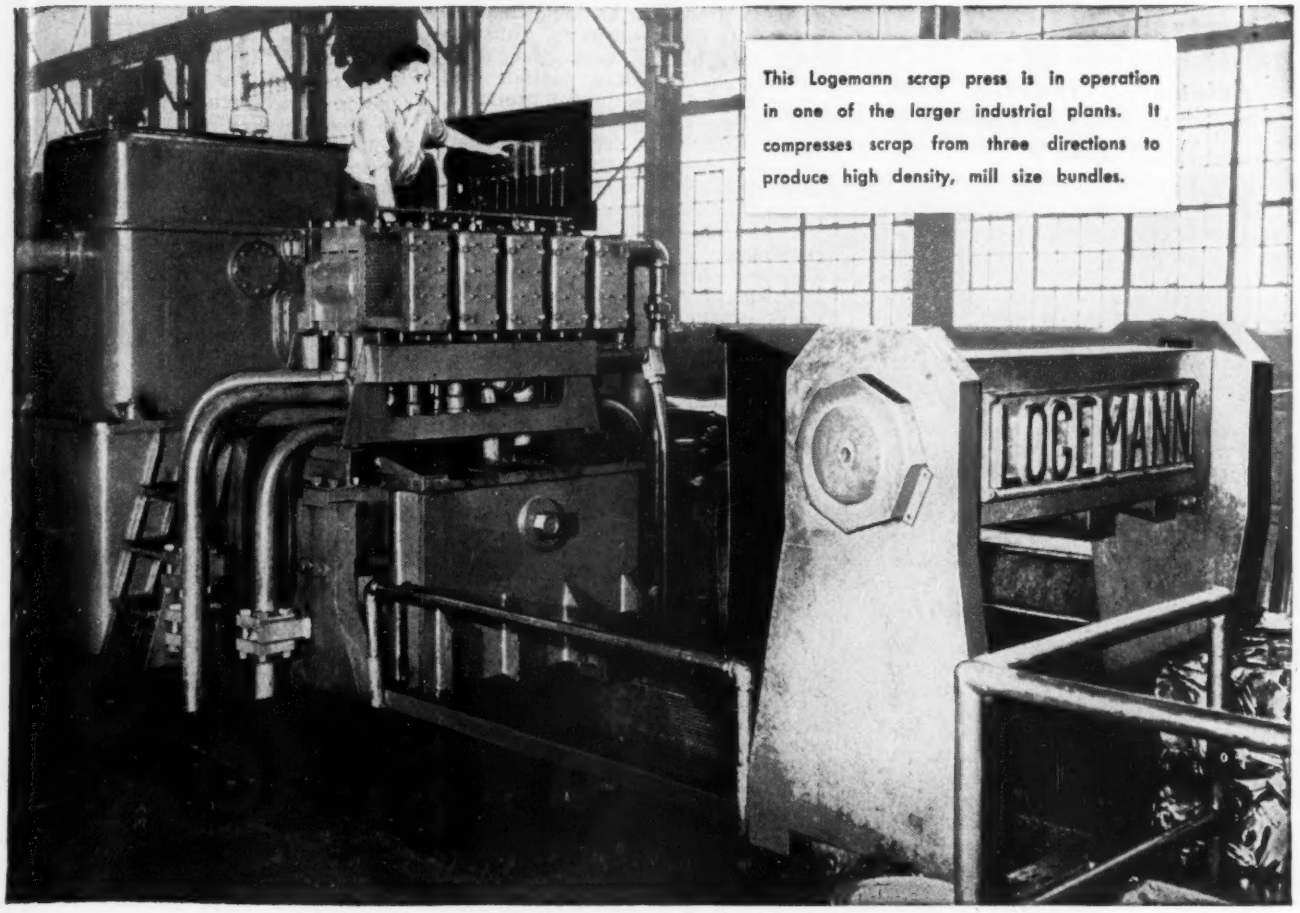
(Delivered prices)

Heavy Melt.	$20.00
No. 1 Bundles	20.00
Mechanical Bundles	18.00
Mixed Steel Scrap	16.00
Mixed Borings, Turnings	14.00
Rails, Remelting	20.00
Rails, Rerolling	23.00
Busheling	14.00
Bushelings new factory, prep'd	18.00
Bushelings new factory, unprep'd	13.00
Short Steel Turnings	14.00

Cast Iron Grades*

Cast	33.00-35.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.



This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

Self-contained.....
Triple Compression..
Automatically Controlled

LOGEMANN SCRAP PRESSES

handle high tonnages with minimum labor . . . at low cost!

LOGEMANN METAL BALERS

. . . are built in a large range of sizes to meet specific conditions. Let Logemann's engineering service help you arrive at the most efficient and economical way of handling your scrap.

The compact unit illustrated is completely self-contained with oil tank and pump located directly over the press . . . utilizing the advantages of short pipe lines. Automatic controls, mounted in front of pump, give the operator full visibility at all times. Controls operate rams successively within a single rigid box. There is no complex construction which means there is *no need for specially-trained maintenance crews.*

Both two-ram and three-ram models are available with automatic controls or for manual manipulation.

Logemann Bros. Co. have specialized in the production of scrap metal presses for sheet mills, stamping plants, scrap yards, and metal manufacturing plants of all types for nearly 75 years. Write for full information—please state the nature of your scrap and tonnage.

LOGEMANN BROTHERS COMPANY
3164 W. Burleigh Street • Milwaukee 10, Wisconsin

Sheets, Strip . . .

Sheet Prices, Page 113

Automotive industry holds "key" to future availability of cold-rolled sheets

Philadelphia — With the fourth quarter near at hand, increasing attention is being focused on the automotive industry. Any marked falling off in the final quarter in that direction would have a broad effect, especially in cold sheets. Yet, judging from the continued pressure from other directions for this particular product, a sharp dip in automotive requirements, which would soften up deliveries appreciably, is not being too widely contemplated.

At present, most producers are booked up about as fully on cold sheets for the fourth quarter as they care to go. Several larger producers are on a consumer quota basis and all, it appears, are restricting their bookings in one way or another. In galvanized sheets, this is also true, even though grain bin requirements are scheduled to sluff off in November. Enameling stock is being rationed by at least one producer. Demand is especially heavy from stove makers and more active than it was a few weeks ago from manufacturers of washing machines, refrigerators and certain other household appliances.

Hot-rolled sheets are not under strong demand, with deliveries available within four to five weeks. Deliveries on stainless and electrical sheets also are not far extended, although in both of these products inquiry has picked up recently; food processers and handlers are buying stainless on a definitely better scale, and more is going into building for trim and other decorative purposes. Some producers of silicon sheets report quite a spurt within the past two weeks, as electrical equipment manufacturers replenish inventories.

Pittsburgh—Pressure for sheet and strip shipments is heavy in anticipation of a steel strike. Steel sheet sellers say business basically has been good and discount influence of a series of labor crises on sheet and strip buying. Backlogs in some cases are not shrinking. A major producer reports virtual "practical capacity" operations will be maintained as long as possible. Heaviest pressure is from automotive and appliance industries. Tightest sheet items continue to be cold-rolled and galvanized. An acute stringency in supply of these grades would be created by a prolonged steel strike. Shipments to Canada are heavier as some Canadian users seek to get the benefit of delivered costs more favorable than those which will apply when monetary adjustments are made.

Chicago—Most mills are now completely sold out for the remainder of the year on galvanized sheets and well into December on cold-rolled sheets. While some have not reinstated a quota system on these products, they are not taking orders for shipment beyond the first of the year. Pressure for shipment of orders promised for September is intense in these products. Shipments of galvanized sheets to grain bin makers seem to be getting special attention and most producers are able to meet promises to these interests. Consumers of cold-rolled indicate that mills generally have gotten farther and farther behind on shipment promises, some saying that four weeks late is about typical now for this product. Hot-rolled sheet capacity is well committed through October, but buying of this product seems to have slackened.

Cleveland — Demand for hot and cold-rolled carbon sheets is strengthening and as a result Republic Steel Corp.'s production of them is nearly sold out for the rest of this year. The strengthening results from continued high consumption of the automotive industry, re-entry into the market by companies such as appliance makers, which have experienced an upturn in business, and resumption of purchasing by consumers who had quit buying in anticipation of a steel price reduction.

Republic's output of galvanized and enameling sheets, which remain on quota, is booked up for the rest of the year.

Hot-rolled carbon strip 5 inches and over in width is sold out for the rest of the year. Cold-rollers account for a large share of this demand. Hot-rolled carbon strip in narrower widths is still available for shipment in the last quarter.

Increased strength in demand for silicon material continues.

On shipments due them in September, consumers have been pressing for delivery before a steel strike.

Boston—Although improvement in flat-rolled steel demand is ascribed to depletion of inventory, there is also encouraging recovery in consumer manufacturing schedules and actual consumption. Any prolonged interruption in the flow of tonnage to users would halt this upward trend.

Heavier ratio of orders is going to Pittsburgh and more distant mills due to filled or more extended schedules of nearby producers. This raises steel costs for some users. Carbon sheets delivered to Boston from Pittsburgh cost consumers in freight $2.80 per ton more than shipment by rail from Sparrows Point; $3.40, from Worcester; $3.00, from Providence; $3.40, from Hartford; $3.60, from Springfield.

For automobile number plates, Massachusetts takes quotations Oct. 3 on 1200 tons, 24-gage deep drawing cold-rolled sheets, 39½ by 96 in. Delivery is wanted in 100-ton lots monthly starting Nov. 10.

Cincinnati — Mills are under increasing pressure for sheet deliveries and undoubtedly this development, in part, is based on anxiety lest labor troubles curtail future supplies. Booking of orders for fourth quarter is steady and in such volume that mills can exercise selection. Some of the buying is to bolster inventories, but district interests withhold any estimate of the proportion of total tonnage so earmarked.

Birmingham—There has been no material letup in demand for sheets, some grades remaining especially scarce. Demand for galvanized sheets is strong with output here sold out for the balance of the year. Strip, especially cotton ties, remains active.

Plates . . .

Plate Prices, Page 113

Pittsburgh—A general steel strike would affect many fabricating shops in this area. Interruption to present schedules on fabricated plate work would be disrupting to many shops just getting under satisfactory schedules as steel plate deliveries come through in good time and volume. Though the volume of new plate work is not showing an uptrend in the experience of some shops, enough business is coming through to maintain backlogs running as much as eight months. By pushing mills, plate deliveries are available in four to five weeks. In normal order procedure, deliveries are running about six weeks. If a general steel strike develops, unfilled tonnage would increase during the shutdown and mill delivery schedules accordingly set back. Moreover, some plate shops have just been able to get their own deliveries on a competitive footing. Delivery promises often have influenced contract awards.

New York — Plate demand is sluggish, with the labor situation in coal and steel a factor. Some consumers are ordering ahead on the theory they might gain if there should be no prolonged disruption in the production of steel and that they would have little to lose in placing orders if a long steel tie-up is experienced. However, many buyers who do not actually need steel at the moment are content to await developments. They realize most plate mills have little tonnage on their books and that they probably would not have long to wait for shipments after resumption of production, should the mills actually close.

Philadelphia—District plate mills are still having a tough battle for tonnage. Most producers have little in the way of backlogs and are finding it difficult to sustain what they have. Requirements from producers of light fuel oil and heating equipment are nearing their peak, if they have not already passed it, and there is little life in any of the heavier consuming lines. Most mills are quoting around three to four weeks, but can do better if pressed; they are being pressed considerably on orders for shipment because of the possibility of a steel strike. Some business, under this pressure, has been booked and shipped within a week.

Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is low on a 23,000-ton diesel powered passenger ship.

Boston—Slight seasonal improvement in demand for plates for fuel tanks and heating equipment has passed its peak, but miscellaneous industrial demand contributes toward maintenance of volume. Delivery schedules with larger mills are more advanced than those maintained by smaller units, November in one instance. Extremely narrow plates are exceptions and can be shipped in October. Other mills' deliveries range from two to four weeks and even less on truck lots.

Substantial tonnage of plates for oil tanks ordered by Boston Edison Co., Weymouth, Mass., will be fabricated by Bethlehem Steel Co., Bethlehem, Pa.

Keeping the Navy "*Ship Shape*" with the Dempster-Dumpster . .

Shipyards, stations, and the men in Uncle Sam's Navy set a standard of cleanliness that is unsurpassed. Helping to maintain this high standard of Navy cleanliness is the Dempster-Dumpster System of materials handling . . . a system of quick pick-up of preloaded containers for hauling, dumping or moving materials.

Exactly 10 years ago the Navy purchased its first Dempster-Dumpster equipment . . . one truck hoisting unit with several containers. Now there are dozens of hoisting units and thousands of Dempster-Dumpster containers of many types at work keeping Navy yards and stations "ship shape." The sturdy steel foolproof and fireproof containers are placed at various places, such as barracks, mess halls, the docks and ship yards, wherever materials (solids or liquids) need be deposited immediately as they accumulate. A Dempster-Dumpster truck hoisting unit quickly picks-up each container when it is filled and hauls it to the disposal area. Contents are automatically dumped and container returned.

If you have a materials handling problem demanding more cleanliness, more economy, and more efficiency, it will pay you to investigate the Dempster-Dumpster System—popularly used, not only by the armed forces, but by municipalities, leading industrial plants, and by large and small institutions of all kinds.

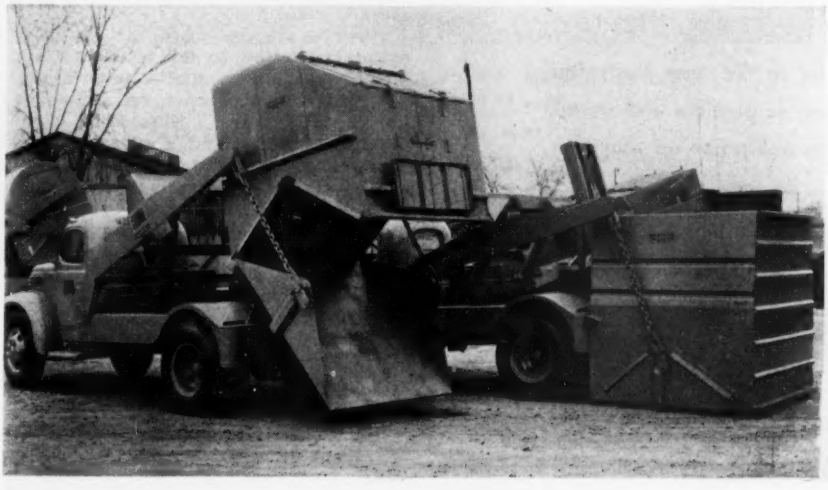
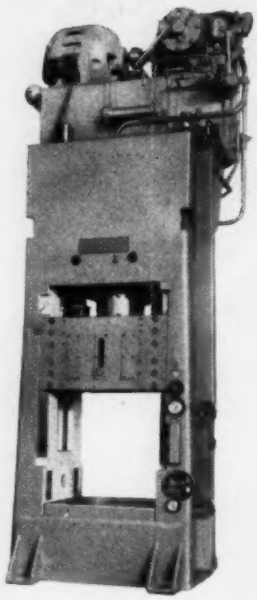


Photo above shows eleven hoisting units recently delivered to the U. S. Navy. Various types of containers are shown in carrying positions. Photo at left shows a hoisting unit preparing to lift a 10 cu. yd. Flat Top container, while another hoisting unit is dumping a 9 cu. yd. Trash and Rubbish Kolector type container. All controls of unit are conveniently located at the driver's seat. One driver and one truck handles any number of containers regardless of types.

DEMPSTER BROTHERS INC.

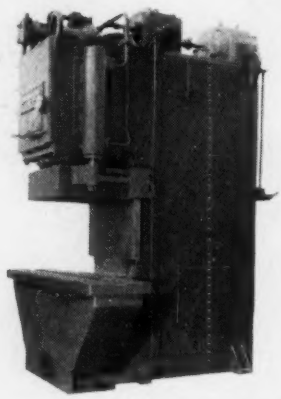
699 DEMPSTER BUILDING
KNOXVILLE 17, TENNESSEE

A WILLIAMS - WHITE machine for every forming, punching, shearing, rolling or pressing operation . . . . . .

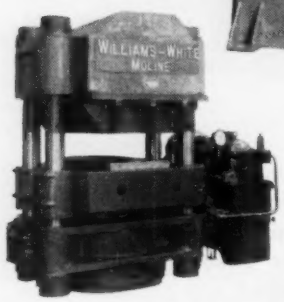


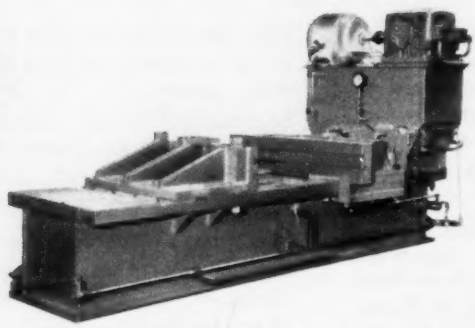
At right: 500-Ton Hydraulic Housing Press: Bed and ram area, 48 x 48 in.; Daylight opening, 54 in.; Stroke, 36 in.; Drawing speed, adjustable; Hydro - pneumatic die cushion.

Below: 500-Ton Hydraulic Gap Frame Press: Platen surface, 24 x 96 in.; Throat, 18 in.; Daylight opening, 30 in.; Stroke, 24 in.



Below: 600-Ton Column Moving Up Hydraulic Press: Platen surface, 42 x 60 in.; Daylight opening, 24 in.; Stroke, 12 in.





At right: 200-Ton Hydraulic Bulldozer, with adjustable end lug. Die space, 36, 48 and 60 in.; Stroke, 24 in. Foot button or treadle control.

THE hydraulic machines shown above are representative of the equipment built by WILLIAMS-WHITE & CO. It is famous all over the world for quality and long service.

When interested in machines similar to the ones illustrated, write us, giving as much information as possible and we will send complete specifications with no obligation on your part.

MAKERS OF PRECISION PRODUCTION MACHINERY FOR NEARLY 100 YEARS

WILLIAMS-WHITE & Co.

MOLINE, ILLINOIS

Wire . . .

Wire Prices, Page 114

Boston—Not since before the war has supply of semifinished steel for wire processing been so heavy. Non-integrated producers are now getting a sufficient tonnage of rods and in a broader range of specifications. Buying is marked with more forward orders for November and December, but bulk of inquiry remains for near-by shipment, indicating inroads have been made on inventories. Most users of specialties, including consumers of mechanical springs and close spring wire, are more active in the market.

Birmingham — All wire specifications remain relatively strong with extended warm and dry weather contributing to the sustained agricultural demand. Barbed wire is somewhat weaker, but most woven grades are strong. Nail supply is generally ample, but barely meets that for the more popular sizes.

Steel Bars . . .

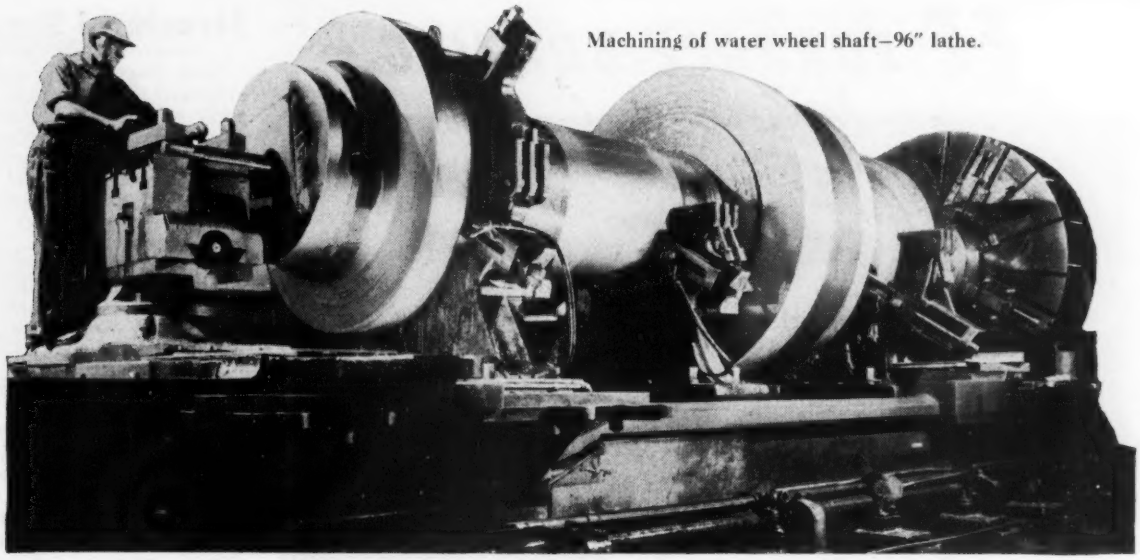
Bar Prices, Page 113

Chicago — Buying for immediate shipment reached fever pitch last week as some mills put on extra furnaces to try to satisfy the inflated demand. Most producers maintain that not all the pressure stems from the strike threat, metalworking operations generally appearing to be moving toward a higher rate. Steel bar sales, however, do not seem to be benefiting nearly as much from the upswing as certain other products, notwithstanding the diversified nature of consumers of this item. In fact, one of the more optimistic local producers who has stoutly maintained that customers, while slow to specify, will take up all open rolling capacity later this year, now is not so sure. Open capacity at and prompter delivery from certain other mills is starting to dampen his optimism. Cold-drawers are buying substantial tonnages as they try to build up stocks.

New York—Carbon steel bar business is fairly well sustained, although there was some leveling off as the steel strike deadline of Sept. 25 approached. Walkout at the coal mines also is retarding new orders, although consumers are attempting to get in as much tonnage as possible on orders already placed.

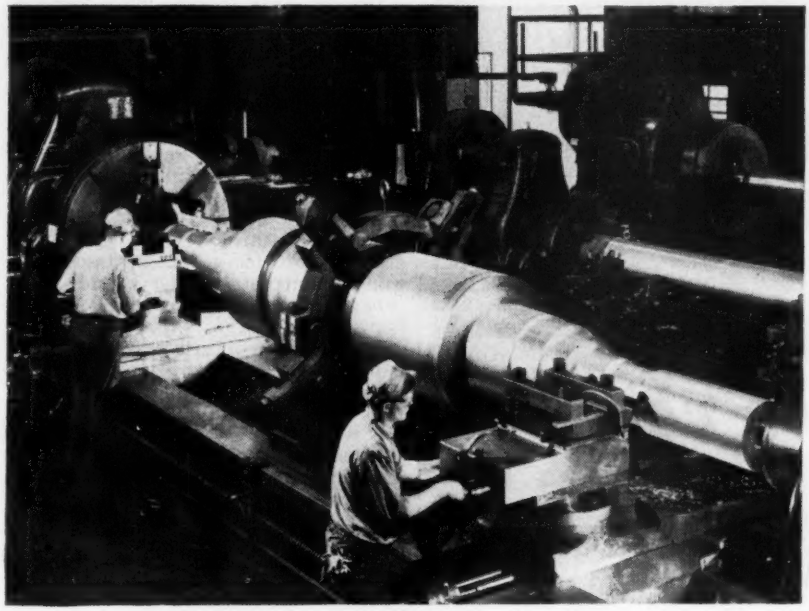
Boston—Improvement in bar demand is limited to hot-rolled carbon stock. Buying is spotty with October mill schedules open on numerous sizes and grades. Slump in cold-finished bar demand continues with production adversely affected. Alloys are available in two or three weeks. Bars are near the bottom of the list in recovery of most steel products. Excess inventories were heavier and more widely distributed.

Philadelphia—Hot carbon bar specifications are about holding their own, with mills reporting little change in backlogs. Most sellers can still accept business for shipment by the middle or third week in October. While alloy bars appear in slightly better demand, deliveries remain easy.



Machining of water wheel shaft—96" lathe.

heavy FORGINGS to your specifications



Turning generator shaft—60" lathe.

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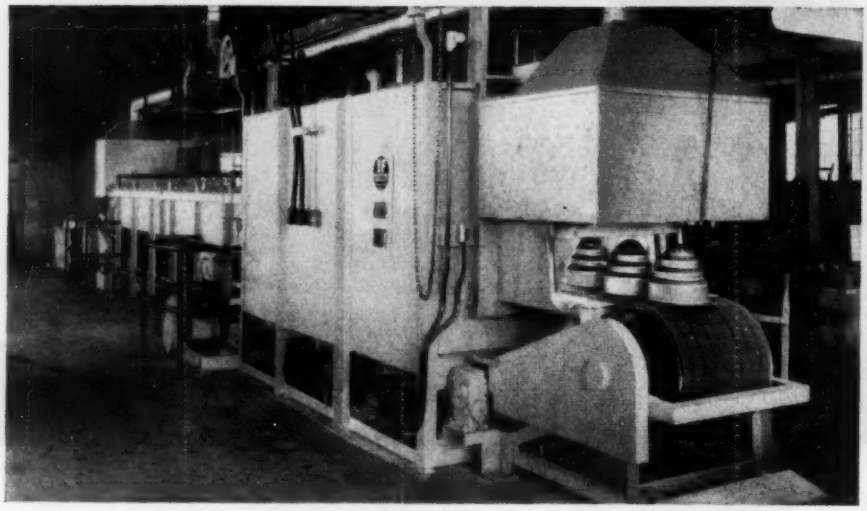

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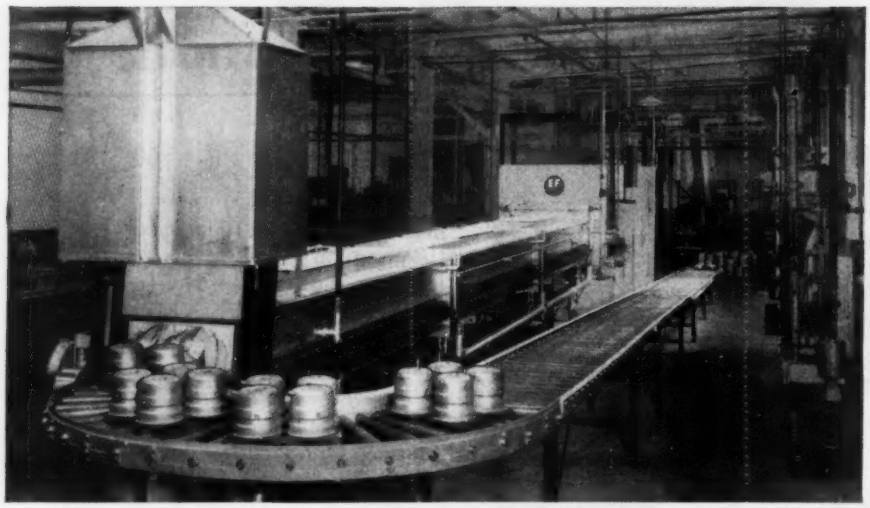

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Structural Shapes . . .

Structural Shape Prices, Page 113

New York—Structural fabricators generally look for a seasonal decline in business next quarter, especially in bridge work. This likely trend will be accentuated in all lines of construction should there be any prolonged disruption in steel production due to the coal or steel labor controversy, or both. Actually there is a definite slowing up in inquiry due to the uncertain labor outlook.

Once current labor controversies have been settled and depressing seasonal influences have passed, a substantial spurt in construction work is expected. Most fabricators look for an unusually active market next spring, in view of the many sizable projects under consideration. One large program in prospect involves a New Jersey turnpike requiring an estimated 100,000 tons of structural steel, much of it in northern New Jersey, where three large high level bridges are under contemplation. Some look for this work to become active during the first half of next year. A large pier program also is shaping up for the city of New York, to say nothing of several large office buildings and apartments.

Philadelphia—Shape deliveries on the standard sections remain around three to four weeks, with much depending on the cycle of rollings. Wide flange sections are available for late October and early November. Although some sizable public work is due for opening this week, notably state bridge construction in western Pennsylvania, current orders are spotty.

Boston — Inquiry for fabricated structural steel in excess of 100 tons is limited largely to public works with bridges predominating. Two spans, Vermont, aggregate 1200 tons, contractor's letting, while contract 1 for these three bridges, Olneyville cutoff, Providence, R. I., takes 636 tons. Contracts placed include 1135 tons, viaduct and approaches, Waterbury, Conn.

Standard structural plain material supply has eased to a point where shipments are possible in three to four weeks. The fair volume of small-lot work being booked by district fabricating shops is insufficient to prevent shrinking order backlogs.

Pittsburgh—Fabricating shops here are getting a sustained volume of business. Backlogs in some instances have been whittled down as structural deliveries have improved. A general steel strike would reverse this situation. In fact, most fabricating shops here expect to be shut down in event of a strike in the basic steel industry. A strike threat, however, has not been a direct influence on structural activity. Seasonal decline in structural markets has not yet set in but is expected possibly late in October or early November. If a steel strike develops, seasonal influences will be minimized when resumption of steelmaking and fabricating is possible. Most of the recent new work has been for bridges on highway projects. Considerable volume of such work is in the offing in connection with extensions on Pennsylvania turnpike.

Seattle—Local fabricating plants report business slow, new orders be-

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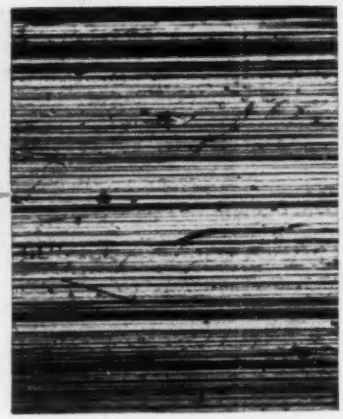

GROUND RACEWAY SURFACE
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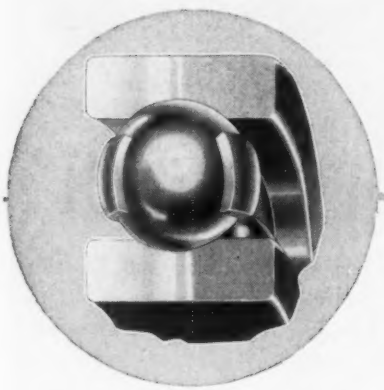

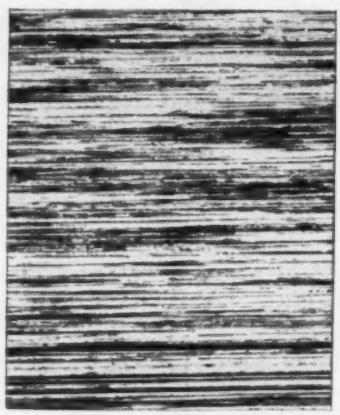

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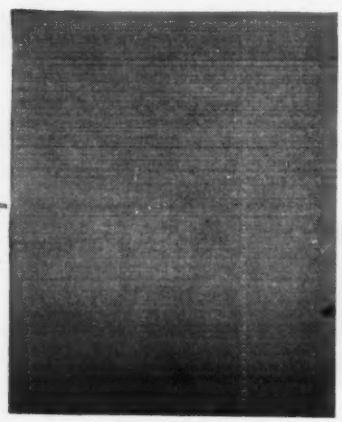

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ing confined to small tonnages. Order backlogs are shrinking rapidly and additional jobs are sought. Competition is increasing.

Several sizable projects are pending, the largest being 1275 tons for a Bureau of Roads bridge near Coeur d'alene, Idaho, for which the general contract has been placed.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 113

Seattle—Demand for reinforcing bars is tapering, small tonnages predominating. Mills are cutting into order backlogs.

Northwest Steel Rolling Mills Inc., announces it will begin producing hot-rolled strip and flats, 2 in. and under, in the fourth quarter and by the first quarter 1950 will be prepared to roll 1 x 4 in. flats. Heretofore, operations have been confined to bars and angles.

This plant is supplying 100 tons reinforcing for the University of Washington art school.

Bethlehem Pacific Coast Steel Corp., Seattle, has booked several hundred tons for various construction projects in the immediate area.

Birmingham—Demand for reinforcing bars is strong. Considerable amount of this type construction is under way, along with bridge and highway repair work.

Alloy Steel . . .

Alloy Steel Prices, Page 115

Cleveland — Republic Steel Corp. has put on an additional open hearth and an electric furnace at its alloy steel producing plant at Canton, O. The company's alloy steel melting facilities at Massillon, O., remain closed.

Tin Plate . . .

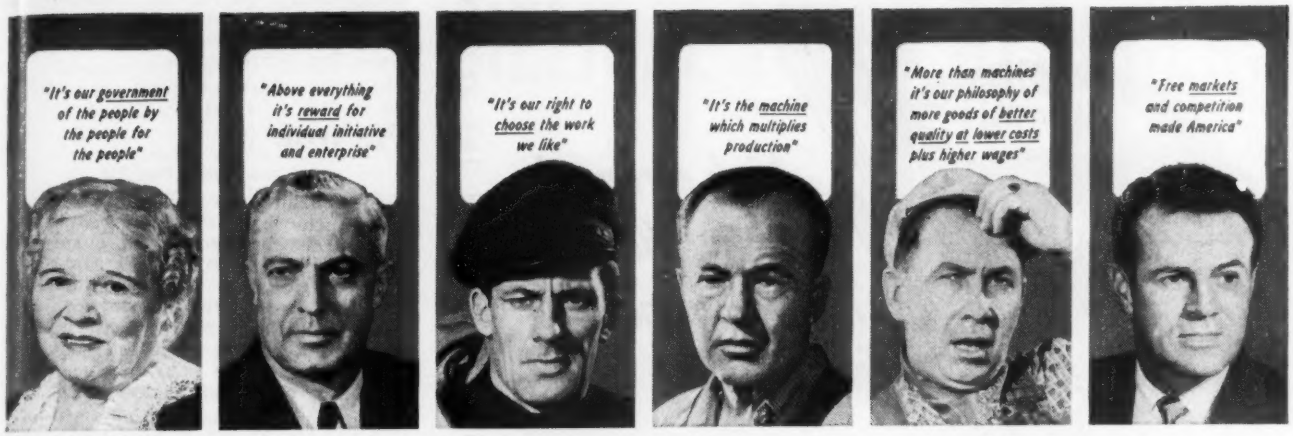
Tin Plate Prices, Page 114

Pittsburgh—Tin plate orders for the first half of November are in good volume at some mills. This business is not influenced by the steel labor crisis. Most users are well protected against a strike contingency, having laid in good stocks prior to the previous crises last July and Sept. 14.

Demand for black plate is heavy in some instances as a result of improved activity in the refrigerator manufacturing field. Black plate (for tinning) shipments to Canada are spurting, the understanding here being that Canadian users would benefit in lower delivered costs on material received before the end of September when adjustments in monetary values will become effective.

Hot-dipped tin plate for export is picking up in one instance, but export volume as a whole is maintaining a dull pace. Whether devaluation of the British pound sterling will cut into American exports of tin plate will depend upon the extent of tin plate production in Great Britain. Some sources believe demand from Britain's "normal" export markets should take care of its tin plate production in excess over home requirements.

Curtailed output of tin mill items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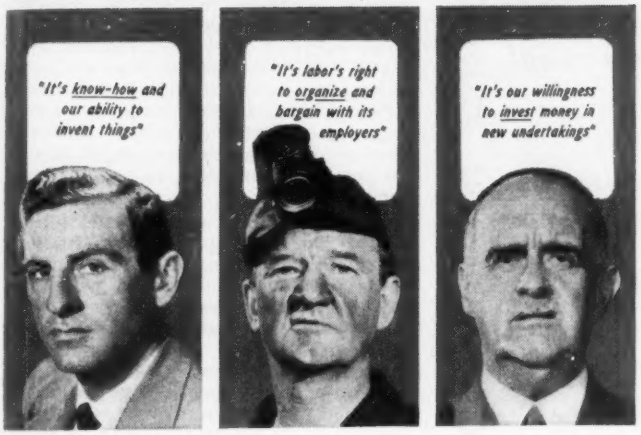
"It's our right to choose the work we like"
"It's the machine which multiplies production"
"More than machines it's our philosophy of more goods of better quality at lower costs plus higher wages"
"Free markets and competition made America"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during fourth quarter will result from changeover to speedier operations at the Carnegie-Illinois Steel Corp. Gary, Ind., works.

Pig Iron . . .

Pig Iron Prices, Page 112

Pittsburgh—Merchant pig iron demand prior to the steel labor crisis had turned up sharply in some instances. Though some soft spots remain in foundry pig iron demand, merchant producers are enjoying fairly good business. Bright spots in the market have been increased requirements from the automotive and plumbing and heating industries.

Considerable foundry iron continues to be shipped out of this district on special contract to General Motors Corp. Foundries depending upon the steel industry, tool steel makers and ingot mold manufacturers are not faring too well. Demand for mine castings and railroad equipment castings also continues slow. Jobbing foundry volume this year is off about 60 per cent, according to rough trade estimates.

A general steel strike would likely halt all merchant pig iron production in this area, since all producers are covered by wage contracts with the CIO-USW. The several threats of a steel strike have stimulated pig iron shipments to the more active consumers, and some blast furnace stocks, which earlier in the year had assumed impressive proportions, have been sharply reduced. Hence, a steel strike halting iron output would create a supply stringency in short order.

Some steel company stacks were being prepared for banking early last week. Wheeling Steel Corp. last Tuesday reported one stack already banked, with another scheduled to go down by the end of the week. These curtailments were laid to the coal mine shutdown which has made coal conservation necessary.

New York—Pig iron specifications have been steadily on the upgrade so far this month, partly because of somewhat heavier requirements and partly because of the threat of labor troubles in coal and steel. What the trend will be over the remainder of this month depends a whole lot on what final action is taken in the steel controversy. Suspension in coal production is not expected to have an immediate effect on pig iron output, although there is extra buying for protective purposes.

Philadelphia—Demand for foundry iron this month is showing definite improvement over August. This is a seasonal trend, although the menacing labor outlook, not only in steel but in coal, has tended to stimulate business.

Buffalo—Demand for merchant iron holds around the best level of the year as blast furnace operations begin to fall in preparation for a threatened steel strike. Sellers report the marked improvement in demand is attributed only in part to buying in anticipation of labor trouble. At least two furnaces are slated to be added to the active list when the strike threat ends. Bethlehem

knocked off one furnace early in the week and also pared coke oven output.

Chicago—Sellers are being stormed with calls from customers who suddenly find they are fresh out of pig iron and coke. Several, with delivery promised for October, are trying to enlarge stocks and are being refused immediate shipment. Under present conditions, no one is able to say with certainty what actual demand is. Foundry operations on the whole appear to be moderately improved but the number of melting shops which are working at a reduced rate still appears larger than those which have returned to a normal work-week. Indications are that, if a steel strike is averted, many foundries will be out of the pig iron market for a prolonged period; if there is a strike, iron supply will be ample except for a very long shutdown. Coke demand, given impetus by the coal strike and threat of a steel strike, is probably more exaggerated than that for iron.

Cincinnati — Foundry operations have developed marked gains since the low point in July, although this is not fully reflected by the volume of pig iron buying. Shipments are steady at a level higher than last summer, but a considerable part of the present melt is based on pig iron and scrap inventories. Caution in production earlier in the year on heating equipment is the explanation for an unexpected upturn now in that item.

Birmingham—Improvement in pig iron continues with shipments in September considerably ahead of those in August, the best month since May. There has been considerable buying against the possibility of a steel strike and as a result of the coal strike.

Iron Ore . . .

Iron Ore Prices, Page 116

Cleveland—Stocks of iron ore continue to accumulate rapidly as shipments are maintained at a high rate while consumption is on a curtailed basis. On Sept. 1, total stocks of Lake Superior iron ore amounted to 40,811,232 tons compared with 35,063,647 tons a month earlier and 37,080,989 tons a year ago, according to the Lake Superior Iron Ore Association, this city. Of the Sept. 1 total, 34,361,530 tons were at furnaces and 4,727,560 tons on Lake Erie docks in the United States and 1,722,142 tons at furnaces in Canada.

Consumption of Lake Superior iron ore increased during August to 5,711,208 tons from 5,258,321 tons in July and compared with 7,036,135 tons in August, 1948. Total for the first eight months amounts to 54,134,295 tons against 51,856,701 tons in the like period a year ago.

A net gain of one blast furnace was made in the number in blast on Sept. 1 in the United States, bringing the total to 143 against 142 on Aug. 1 and comparing with 180 on Sept. 1, 1948. On Sept. 1, 50 blast furnaces were idle in the United States and 2 in Canada.

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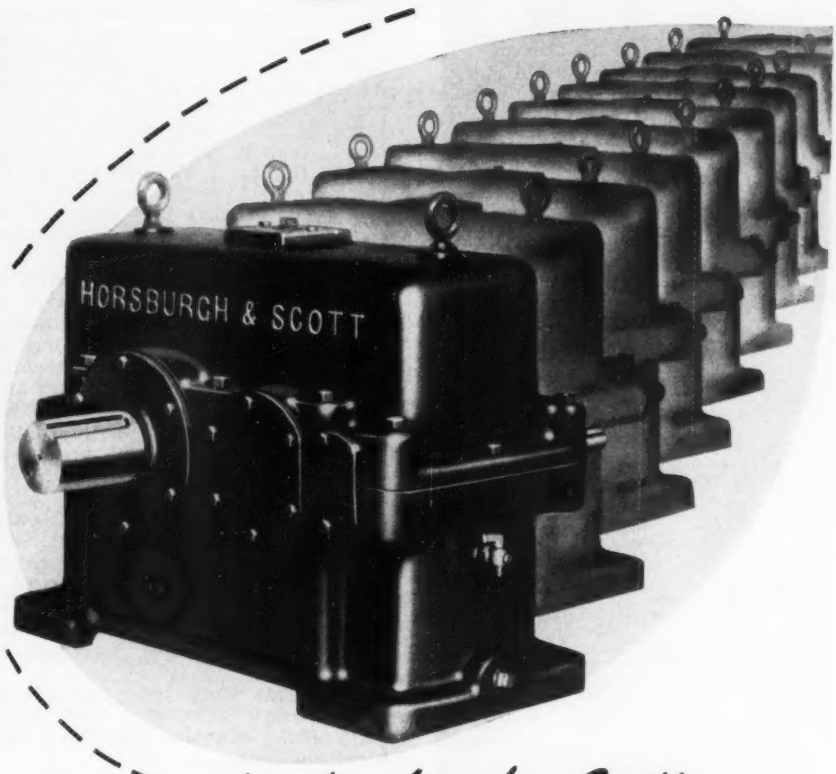

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Scrap . . .

Extension of steel strike truce curtails buying of heavy melting grades

Scrap Prices, Page 120

Pittsburgh—Extension in the steel strike truce to Oct. 1 has placed scrap trading here in a state of watchful suspension. Buying activity has subsided in the heavy melting grades, which remain nominally unchanged at $30 for No. 1 and $28 for No. 2. Until the steel pension issue is cleared up, scrap interests here look for no important buying in the open-hearth grades.

Interest in blast furnace scrap is sharpening as operators endeavor to conserve fuel by using more turnings. Crushers have advanced their buying prices about $2 a ton for machine shop turnings and mixed borings and turnings to $20, delivered. Short turnings are proportionately higher at $22. Other turnings are sympathetically stronger. With No. 1 heavy melting steel at $30, the present price of $22 for short turnings is still out of line with "normal" differential. Under OPA, the spread between those grades was only $3 a ton. If demand from blast furnaces shows any stamina, some sources here look for further advances in turnings.

Industrial scrap lists continue to carry heavy offerings. The latest automobile company lists are particularly heavy.

Cast grades are nominally unchanged, but are still firm.

Philadelphia—Despite the threatening labor outlook in steel, the undertone in steel mill scrap continues strong. There has been some mill buying at $25.00 delivered, for No. 1 heavy melting and on a somewhat larger scale than a couple of weeks or so ago.

Currency devaluation abroad has tended to whet further interest in foreign scrap, particularly in view of the continued strong tone in the domestic market.

Machine shop turnings are higher at $17.00-$18.00; short shovel turnings, at $18-$19; mixed borings and turnings, at $16-$17. Bar crop and plate and punchings and plate scrap are up $1.50 to $27.00-$28.00, delivered. Cut structurals are higher at $26-$27; electric furnace bundles to $25-$25.50. Heavy turnings are now $25.00, delivered; No. 1 chemical borings, $23-$24.

Leading pipe mills have closed on No. 1 cupola cast at $38, delivered, with a fair amount of tonnage coming out at that figure. Should the labor controversies in coal and steel reach early peaceful settlement, this price may mark the peak for the time being. No. 1 machinery cast is higher at $39; charging box cast and heavy breakable, at $35-$36. Unstripped motor blocks are higher at $33; clean auto cast, at $39; and No. 1 wheels at $38-$39. Mark malleable nominal.

New York—Brokers' buying prices for No. 1 heavy melting steel are unchanged at $18.50, f.o.b. shipping point. No. 2 is slightly higher at $17, with No. 1 busheling, No. 1 bundles and No. 2 bundles unchanged.

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Machine shop turnings and mixed borings and turnings are higher at $10-$11; short shovel turnings are $11-$12. Punchings and plate scrap and cut structurals are up $2 a ton to $22-$23; electric furnace bundles have advanced to $21.

While there has been some mill buying of heavy melting steel, most consumers are moving cautiously. In the Pittsburgh area, some shipments are held up by consumers because of the possibility of a strike. No such action has been taken on shipments into eastern Pennsylvania.

Brokers have sharply increased their prices on No. 1 cupola cast to $31-$32, fob shipping point; No. 1 machinery, to $33; unstripped motor blocks, to $27. Charging box and heavy breakable cast have advanced more modestly to a range of $26-$27.

Boston—Heavy melting steel scrap is stronger on buying by brokers; consumer demand is lagging. Yards are reluctant to sell at current prices and when in position to hold onto tonnage are inclined to do so. Prices on cast grades are firm, but demand is limited. Inventories are still ample in many instances to cover the current level of melt for some time. Steelworks operations are off again, about 10 points, and district consumers of scrap for steelmaking show only slight interest in making commitments.

Cleveland — Small-scale buying of No. 1 heavy melting steel scrap at $31 a ton by consumers in the Mahoning Valley has influenced a rise in quotations at Cleveland for steelmaking, blast furnace and foundry grades. Cleveland quotation on No. 1 heavy melting steel is $26.50 nominal, which means it would not be unexpected if a price a dollar a ton above that would be paid if a sale were made. Cleveland quotations last week were up $1.50 a ton on open-hearth and electric furnace grades and up $1 on blast furnace and foundry grades. These increases were largely responses to price strength in the Valley, not local demand.

Quotations in the Valley were up $1 to $1.50.

Uncertainties arising from steel labor negotiations have been an important factor in deterring scrap purchases by mills.

Buffalo—Firm bids and price increases of $1.50 to $3 dominate the scrap market, despite threatening labor developments in the steel industry. One of the leading mill consumers broke a six-week stalemate in steelmaking items with purchases aggregating about 12,000 tons. The sale included No. 2 heavy melting at $26, up $2; No. 1 bundles at $28, up $3; No. 2 bundles at $24.50, up $2.50, and short shoveling turnings at $22, up $3. Although leading buyers of No. 1 heavy melting remain on the sidelines pending clarification of the labor picture, offerings of the item are available at $28. Additional sales are being made in cast items at unchanged prices.

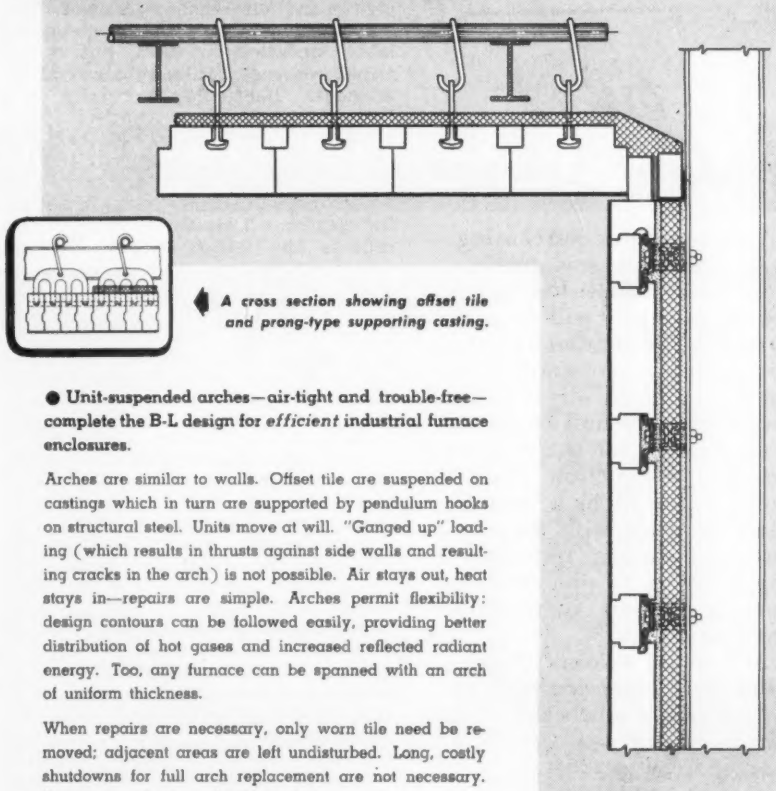
Chicago — While reports of higher prices for steelmaking scrap still are prevalent, purchase last week of No. 1 heavy melting steel by a local mill at $27 affirmed quotations of the previous week which were based on appraisal of the market situation. Brokers are covering this purchase at $26. Some industrial scrap is bringing as high as $2 and $3 over the district mill's buying price, although less of this kind of deal is evident as unsold scrap stocks mount and more caution is displayed. Traders are extremely sensitive to progress in the steel labor dispute. President Truman's request for an extension of the truce raised their hopes that mills here would not find it necessary to embargo scrap as was necessary in some eastern districts in midweek. Railroad scrap continues to command a disproportionately high price to dealer and other industrial grades. This situation has dealers especially upset, claiming that much of their material, which remains in limited demand, is as good in quality.

Detroit—Scrap market is becalmed while buyers and sellers wait to see what is going to happen in the steel labor dispute. Sentiment is noticeably weaker, although in the absence of sales this is not reflected in price quotations. It is felt in some quarters that if a steel strike is avoided, the market will resume its upward movement. Automotive lists of production scrap are now being issued, many of them scheduled for closing Tuesday. They are uniformly in high volume.

Cincinnati—Scrap prices are higher. Increases in bids on railroad lists have had an influence in strengthening the entire market in spite of rather meager mill buying. More

how to stop heat from raising the roof

Arches can be insulated, as shown here, or air cooled. Note the corner joint and the pendulum-hook supports.



A cross section showing offset tile and prong-type supporting casting.

● Unit-suspended arches—air-tight and trouble-free—complete the B-L design for *efficient* industrial furnace enclosures.

Arches are similar to walls. Offset tile are suspended on castings which in turn are supported by pendulum hooks on structural steel. Units move at will. "Ganged up" loading (which results in thrusts against side walls and resulting cracks in the arch) is not possible. Air stays out, heat stays in—repairs are simple. Arches permit flexibility: design contours can be followed easily, providing better distribution of hot gases and increased reflected radiant energy. Too, any furnace can be spanned with an arch of uniform thickness.

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Springs, Wire Forms, Stampings

foundry inquiries are reported, although it is possible the higher prices now being asked for scrap will mean a return to larger proportion of pig iron in the melt. Some scrap dealers are building stocks on speculation.

Seattle—In view of the uncertain trade outlook, mills are accepting only shipments of scrap en route, instructing that new commitments be held up. Receipts are under current consumption, stockpiles supplying the balance. Plans are in line with a possible mill shutdown. Scrap prices are firm and unchanged.

Warehouse . . .

Warehouse Prices, Page 116

Philadelphia—More jobbers here are extending their free delivery area, with some contemplating an increase in their cartage extras. One distributor has in mind an increase of 10 cents which would increase the jobber's city prices by that amount and would broaden the differential between city and country prices to 25 cents per hundred pounds, against 15 cents as at present.

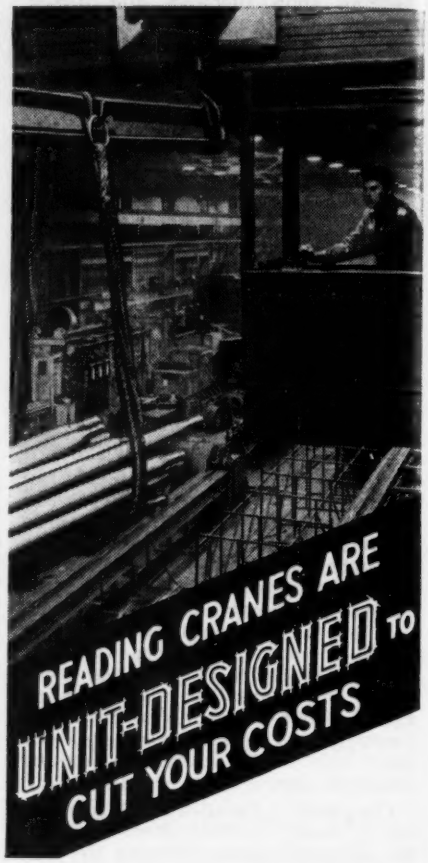
September business is showing improvement over that of August. This may be due in part to the menacing labor situation in steel, but is ascribed more generally to seasonal influences. September normally is a better month than August. Most jobbers regard stocks as being sufficient to meet any early strike contingency in the steel industry. Cold drawn bars are now at a flat 6.11c for city and 5.96c for country. This reflects the latest freight increase.

Pittsburgh—Demand out of warehouse last week was exceptionally brisk as many buyers sought to fortify their stocks in anticipation of a steel strike. If a general mill shutdown occurs, some jobbers expect to be stripped of popular sizes of staple items within a few days. One warehouse here reported sell-outs of a few sizes of hot-rolled flats as prestrike demand developed. Despite reports from the East that warehouses there were planning to discourage "raids" on their stocks by users normally buying from the mills, there is no indication here that a similar mood is prevalent.

Seattle—Uncertainty due to threat of a national steel strike is not stimulating jobbing sales except in a few instances where consumers are short and require immediate delivery. The galvanized sheet situation continues a bottleneck with demand insistent and mills unable to make satisfactory deliveries.

Cincinnati—Warehouse steel sales continue more brisk than in July or August, with some of the ordering and considerable inquiry due directly to unsettled labor conditions in steel and coal. Stocks are complete, with the exception of galvanized sheets. Some adjustments are anticipated soon to reflect the latest freight increases.

Birmingham — Warehouse business is holding to the gains registered over the past several months. Maintenance work is accounting for a substantial part of warehouse tonnage. Stocks generally continue to show improvement.



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READING HOISTS

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 116

Pittsburgh—The coke market is active. With the three-day mine week, which had virtually reduced to a trickle beehive furnace coke output, culminating in a general mine shutdown, a scramble to pick up any kind of coke offered has developed. Considerable tonnage of spot furnace coke has been absorbed.

Demand for foundry coke has been less active, but consumers are showing more interest than previously due to the stringency in coal.

A steel strike would put a damper on the coke market in short order. By-product oven operations would be halted in many instances should steel mills go down. Even if a steel shutdown is averted, the coal mine strike may be expected to take its steady toll on metallurgical coking coal inventories. These stocks are still heavy in this district, with the average said to run about 45 days at least.

Bolts, Nuts . . .

New York — While bolt and nut order backlogs continue to shrink, demand is heavier for manufactured assemblies and building construction. Needs of the latter are best since spring. Export business is slack, due to shortage of dollars abroad. In a few instances buyers are able to get dollar priorities from their governments because of the general importance of the work for which the material is intended.

Backlogs at eastern bolt and nut plants average around four weeks. Operations generally are on a single turn. Prices are steady.

BOILER TUBES

Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	11.50	13.39	13.00	13.00
1¼	13	13.62	15.87	13.21	15.39
1½	13	15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.69	21.89
2¼	13	21.37	25.16	20.73	24.40
2½	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pacific Tube Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1135 tons, viaduct and approaches, Waterbury Expressway, Waterbury, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Monroe & Langstroth, North Attleboro, Mass., general contractor; also 4800 linear feet steel piling, 126 tons, to Bethlehem Steel Co.

1000 tons or more, 11 lower gate leaves and other equipment, McNary dam spillway, Columbia river, by U. S. Engineer, Walla Walla, Wash., to Willamette Iron & Steel Co., Portland, Oreg.

875 tons, factory, American Can Co., Maryland, to Bethlehem Steel Co., Bethlehem, Pa.

780 tons, addition, National Brewery Co., Baltimore, to Bethlehem Steel Co., Bethlehem, Pa.

700 tons, Public School No. 18, Bronx, New

Handle Scrap Faster—Easier

This Burro is handling scrap faster and easier because it moved itself and several cars to the job quickly—and started work without delay. Burros equipped with magnet, clamshell bucket, dragline bucket, tongs or hooks are saving time and money on many jobs in every type of industry. Their powerful draw bar pull (7500 lbs.) and fast travel speeds (up to 22 MPH) make them efficient switch engines too—you can spot cars where and when you want them at a moment's notice. There's no waiting time when a Burro is on your track.

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Clean, bright finish . . . well dressed coil . . . a specialty wire made in a specialty mill under absolute laboratory control. Warehouse stocks.

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THOMAS
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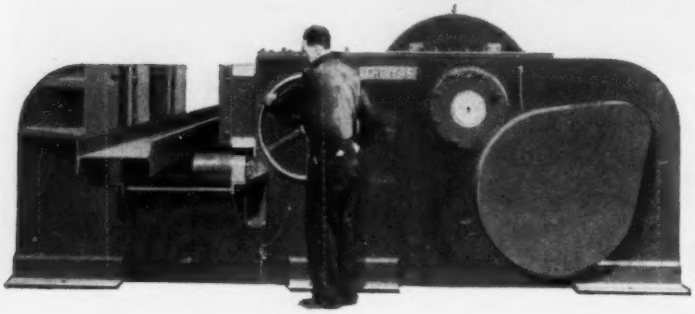
Machines



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McDANEL REFRACTORY PORCELAIN CO.
BEAVER FALLS, PENNA.

York, to Lehigh Structural Steel Co., Allentown, Pa.

475 tons, Kreuger brewery addition, Newark, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

455 tons, sewerage disposal station, Brooklyn, to the Elizabeth Iron Works, Elizabeth, N. J.

430 tons, Pennsylvania state turnpike, section 21-B-1, Cumberland county, to American Bridge Co., Pittsburgh.

380 tons, state road work, Westchester county, New York, to American Bridge Co., Pittsburgh.

160 tons, Manor Oak school, New Hyde Park, Long Island, to unnamed fabricator.

125 tons, Bell Telephone exchange, Haddonfield, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

STRUCTURAL STEEL PENDING

4000 tons, apartment, 11 Riverside Drive, on former C. M. Schwab estate, New York City; plans being completed by Sylvan Bien, architect, that city.

3500 tons, Uris office building, 57th street and Madison avenue, New York; early award expected.

1400 tons, 19 story apartment, Fifth avenue and East 73rd street; pending.

1300 tons, Uris office building, 60th street and Madison avenue; Sam Miskoff, that city, general contractor.

1275 tons, Bureau of Roads bridge near Coeur d'Alene, Idaho; Paul Jarvis Inc., Seattle, low $871,155 and recommended for award.

1200 tons, housing project, South Boston, Mass.; M. S. Kelliher Co., Boston, low on general contract.

850 tons, bascule state bridge, Seabright, N. J.; Ole Hansen & Sons Inc., Pleasantville, N. J., low on general contract.

775 tons, steel bridge superstructure, continuous plate girder, 826 feet, U. S. route 2, Alburg-North Hero, Vt.; bids Oct. 7, contractor's letting, Vermont Department of Highways, Montpelier.

735 tons, milk station, Supplee-Wills-Jones Co., Philadelphia; general contract awarded to McCloskey & Co., that city.

635 tons, three bridges, Olneyville cutoff, Providence, R. I., contract 1; bids in to Department of Finance, Division of Purchases, Franklyn A. Adams, state purchasing agent, Rhode Island.

500 tons, apartment, Shubin Co., Philadelphia; bids Sept. 26.

450 tons, estimated, sewage treatment plant, Nut Island, off Quincy, Mass.

300 or more, taintor valves operating machinery, etc., McNary dam, Oregon state; Northwest Marine Iron Works, Portland, Oreg., low $88,951, alternative $72,755.

210 tons, Labor Union Health Center, Philadelphia, project revived, with S. S. Yellin, that city, low on general contract.

Unstated, transformer circuit takeoff, Hungry Horse dam, Montana; roof and deck, filter house Coulee dam; galvanized circuit towers, Columbia Basin project; gate hoists and appurtenances, Missouri river basin project; bids soon to Bureau of Reclamation, Denver.

Unstated, foundations and galvanized towers and equipment, LaGrande - Tacoma 115 - kv transmission line; bids to Tacoma, Wash., Oct. 3.

Unstated, 375-foot overpass, Gallatin county, Mont., and 250-foot overpass, Glacier county; bids in to State Highway Commission, Helena, Sept. 22.

Unstated tonnage, $1 million Episcopal Sisterhood of St. Mary's, Bayside, Long Island; general contract awarded to William L. Crow Construction Co., New York.

Unstated, 250-foot steel girder Sammamish river span; bids soon to county commissioners, Seattle.

REINFORCING BARS . . .

REINFORCING BARS PLACED

300 tons or more, school at Bellingham, Wash., Branchflower processing plant, Seattle, water and sewer systems, Ladd

On thousands of applications in every field of manufacture, stepless variable speed operation assures exactly the right speed for every operation . . . for every operator . . . the right speeds for each change in the consistency or shape of the material being processed. Such variable speed operation pays off in higher rates of production, a more uniform better quality product and more efficient performance of your equipment and your operators.

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Master Speedrangers provide this infinitely variable speed in an all-metal, mechanical variable speed unit whose compactness and durability are extra features to help you make a good job better. And nowhere else will you find variable speed drives that are so flexible, so easily adaptable and in such a wide range of types and sizes.

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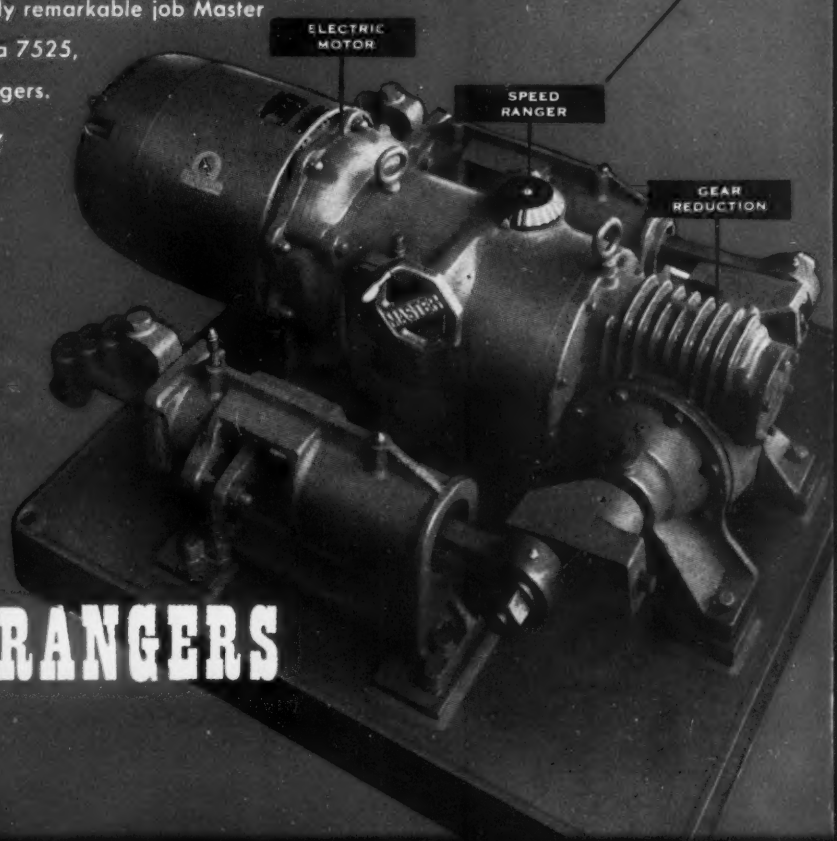
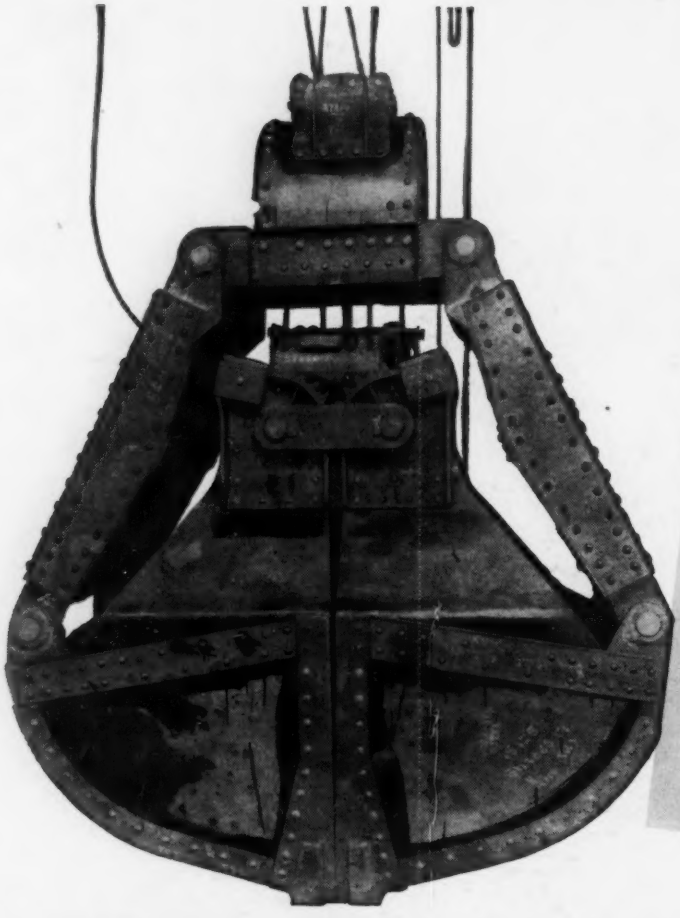
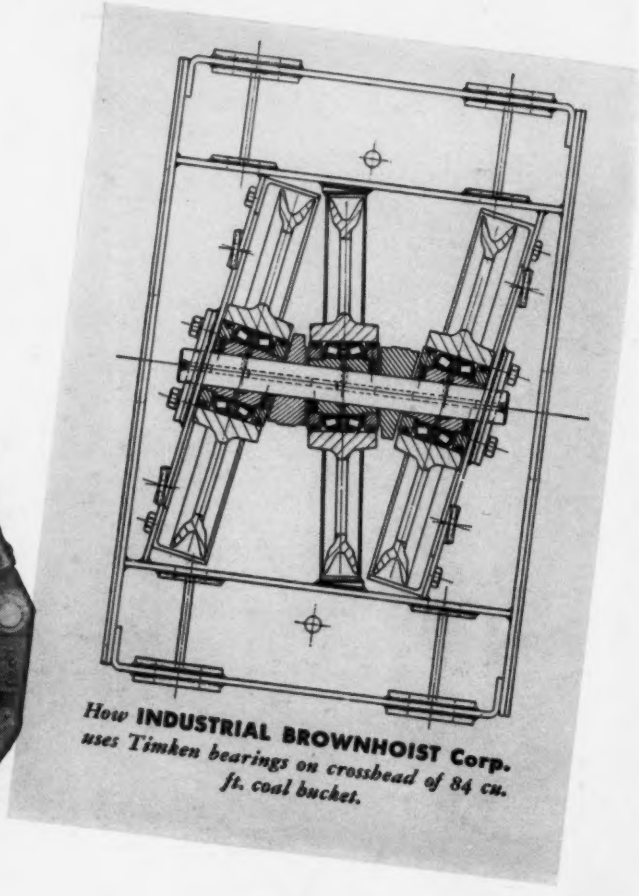


especially when you use

MASTER SPEEDRANGERS





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Lifts coal, lowers cost, with TIMKEN® bearings in crosshead and top block

BY mounting the crosshead and top block sheaves of their 84 cu. ft. coal bucket on Timken® tapered roller bearings, Industrial Brownhoist Corporation insures trouble-free operation, minimum lubrication and maintenance. The sheaves turn freely, frictionlessly under the heaviest loads; sliding of the cable, with resulting wear, is eliminated.

With Timken tapered roller bearings, close-fitting closures can be used to retain lubricants and keep out dirt. True rolling motion and incredibly smooth surface finish enable Timken bearings to operate with negligible friction. Their tapered construction carries any combination of radial and thrust loads.

Timken bearings have extra load-carrying capacity due to the line contact between rolls and races. They're made from Timken fine alloy steel, and normally last the life of the machine in which they are used.

Over the years, the dependable performance of Timken bearings have made Timken-equipped products first choice throughout industry. They add a valuable sales feature—build greater acceptance for your product among customers. When you specify tapered roller bearings, specify "Timken". And when buying new equipment, always look for the trade-mark "Timken" on the bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

DESIGN LEADERSHIP

The first Timken tapered roller bearing was produced about 1898. Since then the one-piece multiple perforated cage, wide area contact between roll ends and ribs, and other important tapered roller bearing improvements have been introduced by The Timken Roller Bearing Company.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

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